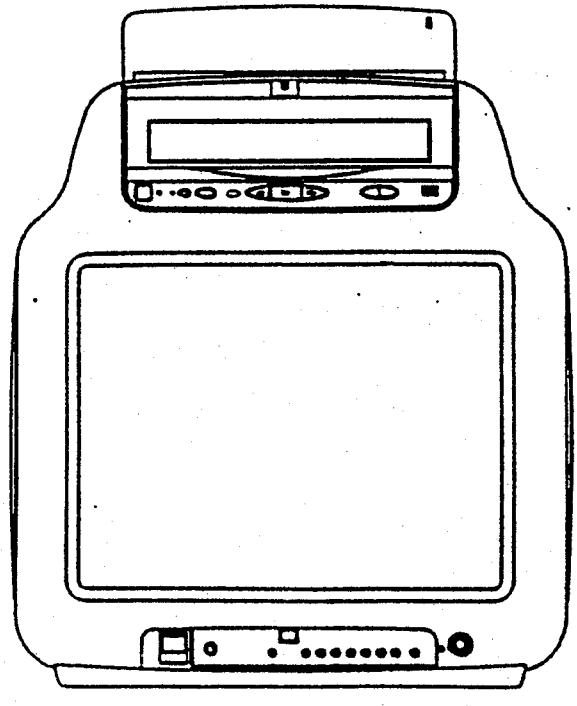
Service Manual

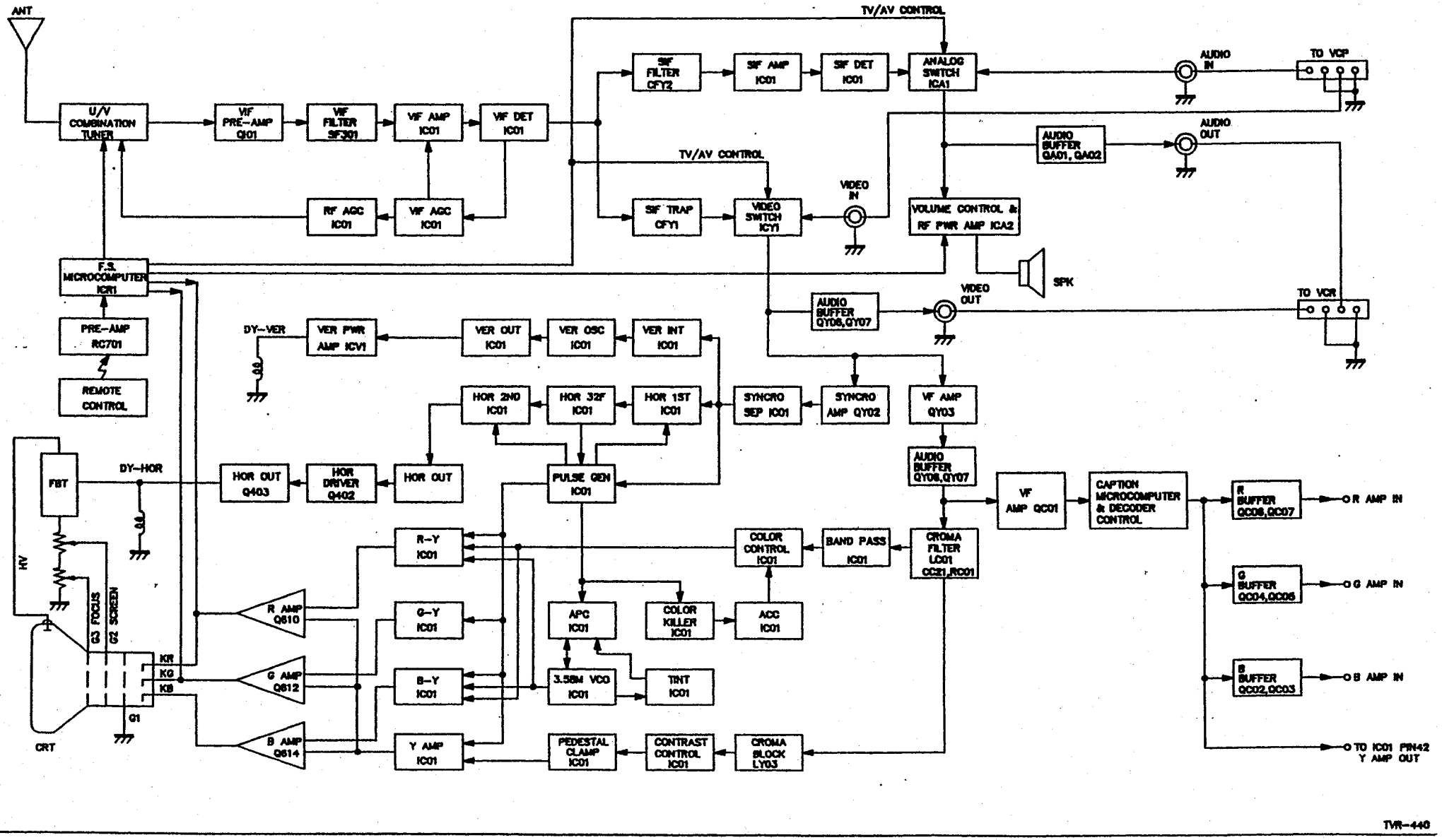
MODEL : TCV9906

13.2 inch (335mm) Colour Portable TV/Monitor with Video Direct Recorder/Player and Remote Control

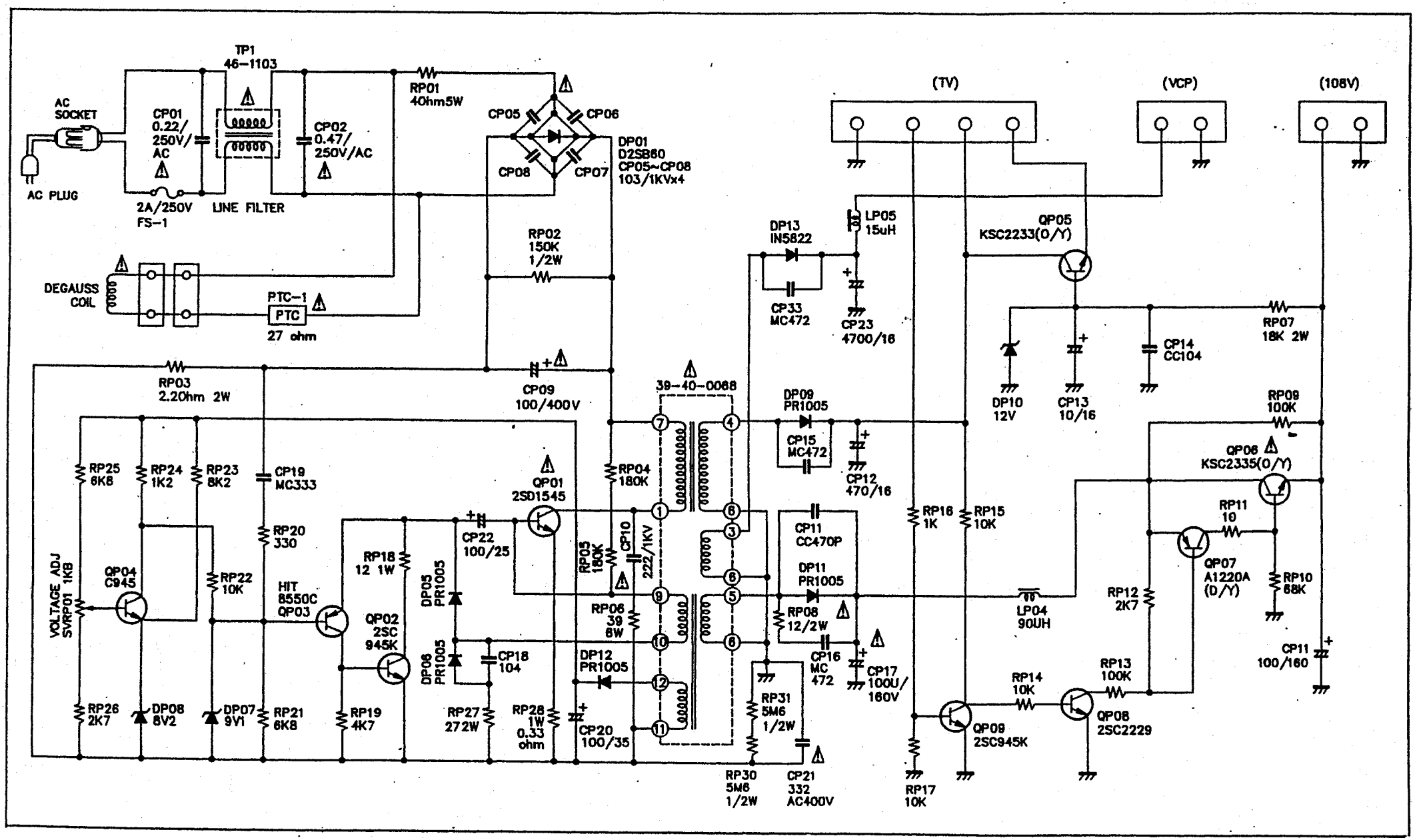


Lenco

TV BLOCK DIAGRAM

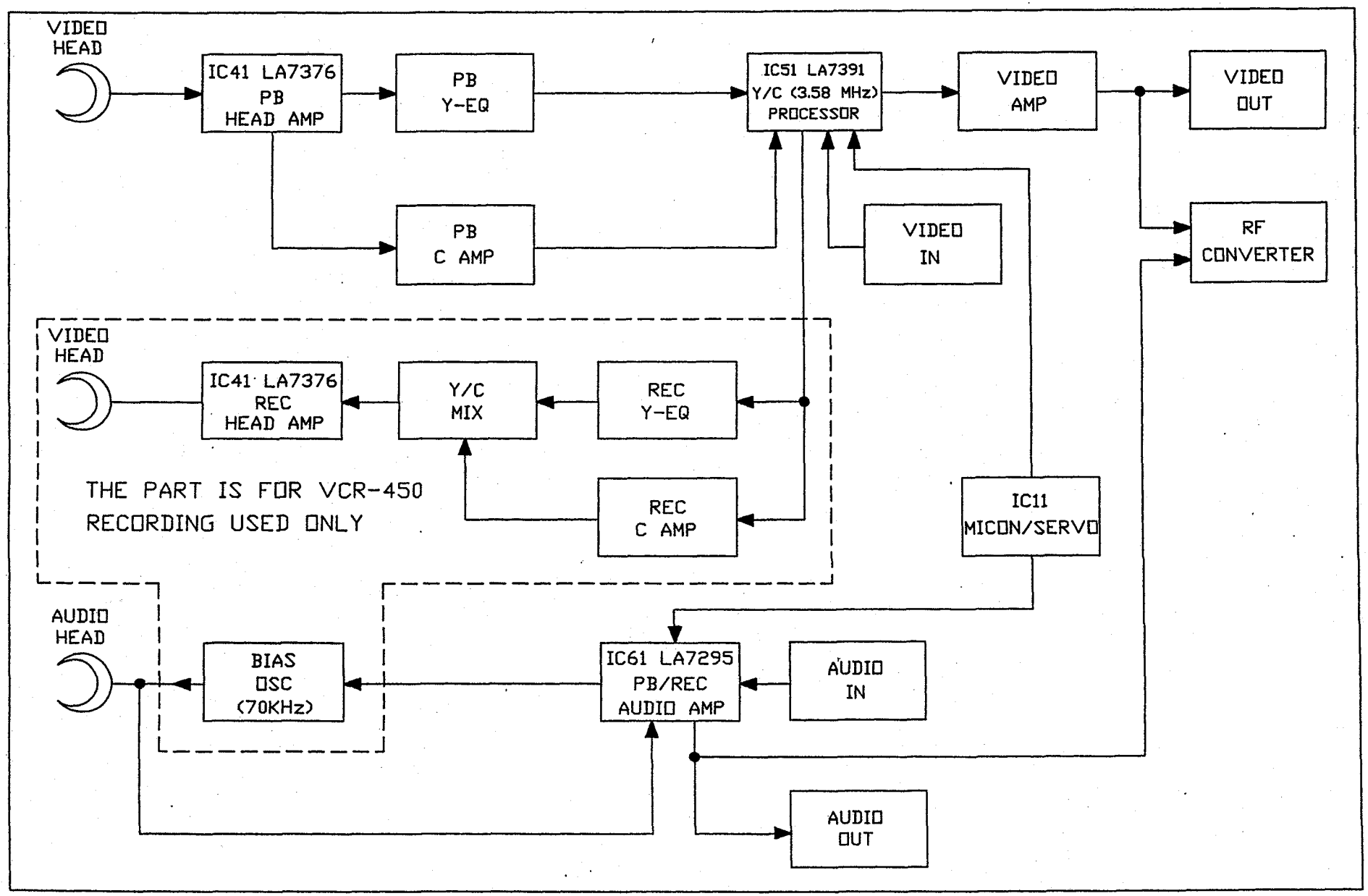


SW POWER SCHEMATIC DIAGRAM

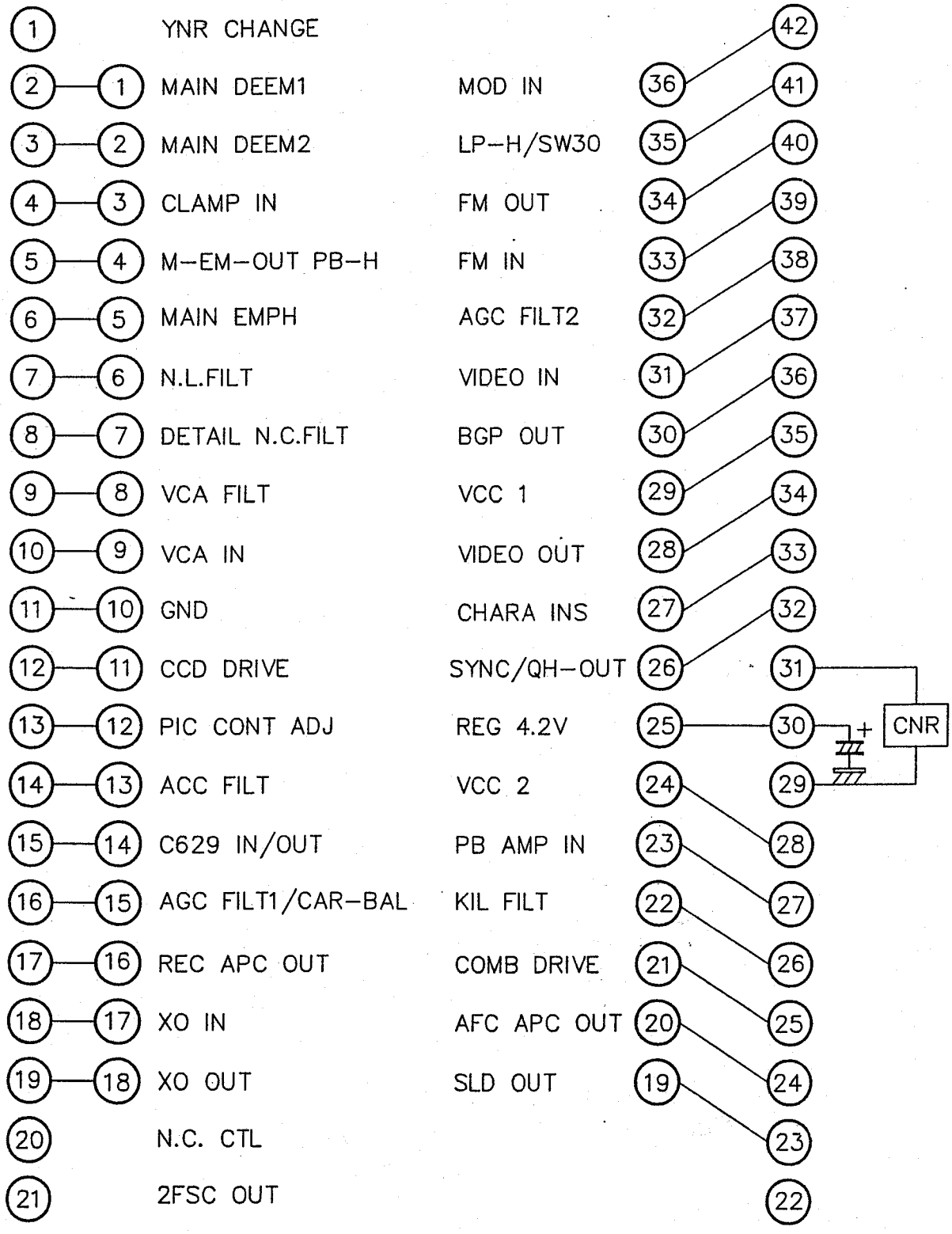


ACTION ELECTRONIS CO., LTD.

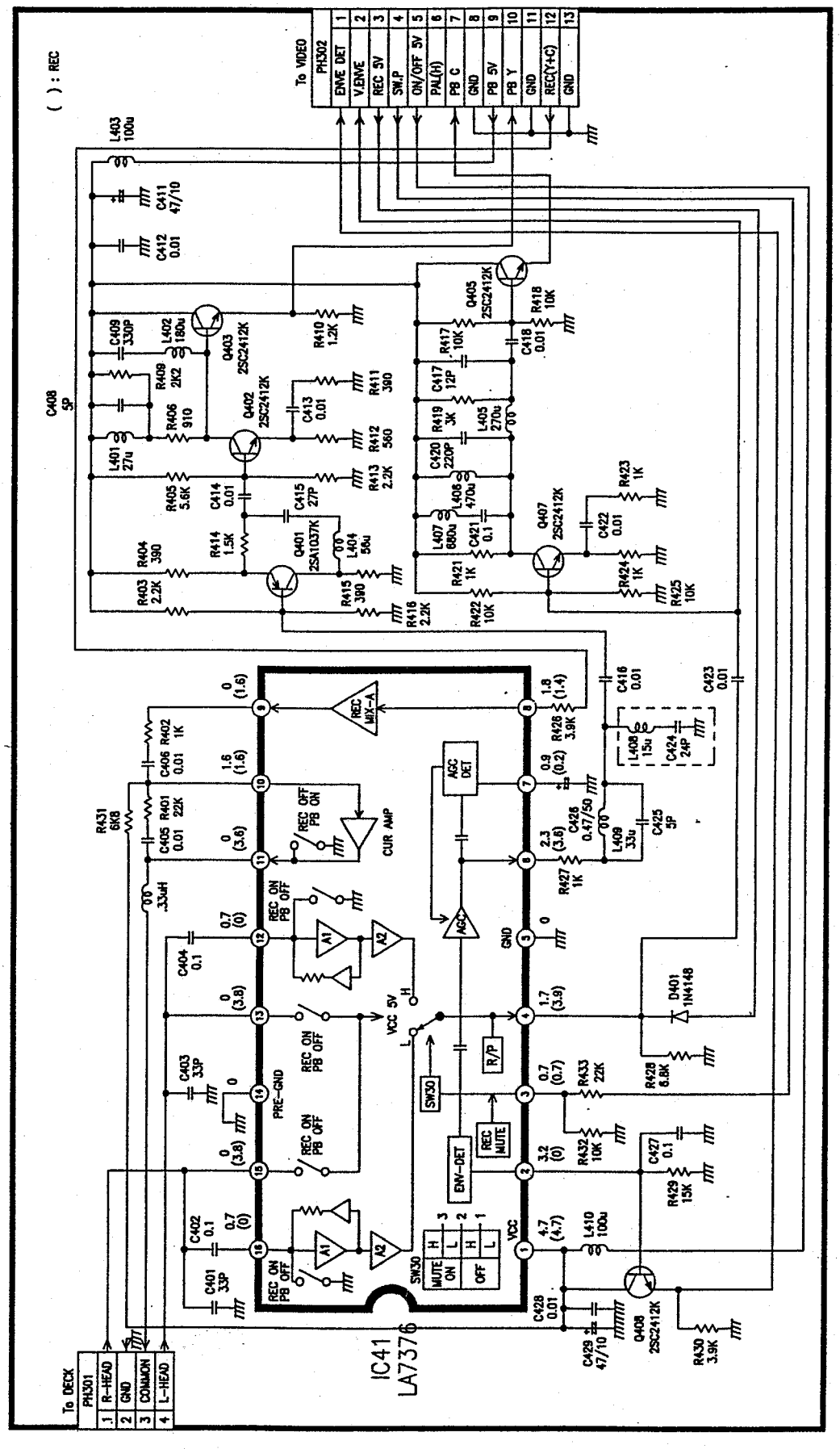
VDR BLOCK DIAGRAM



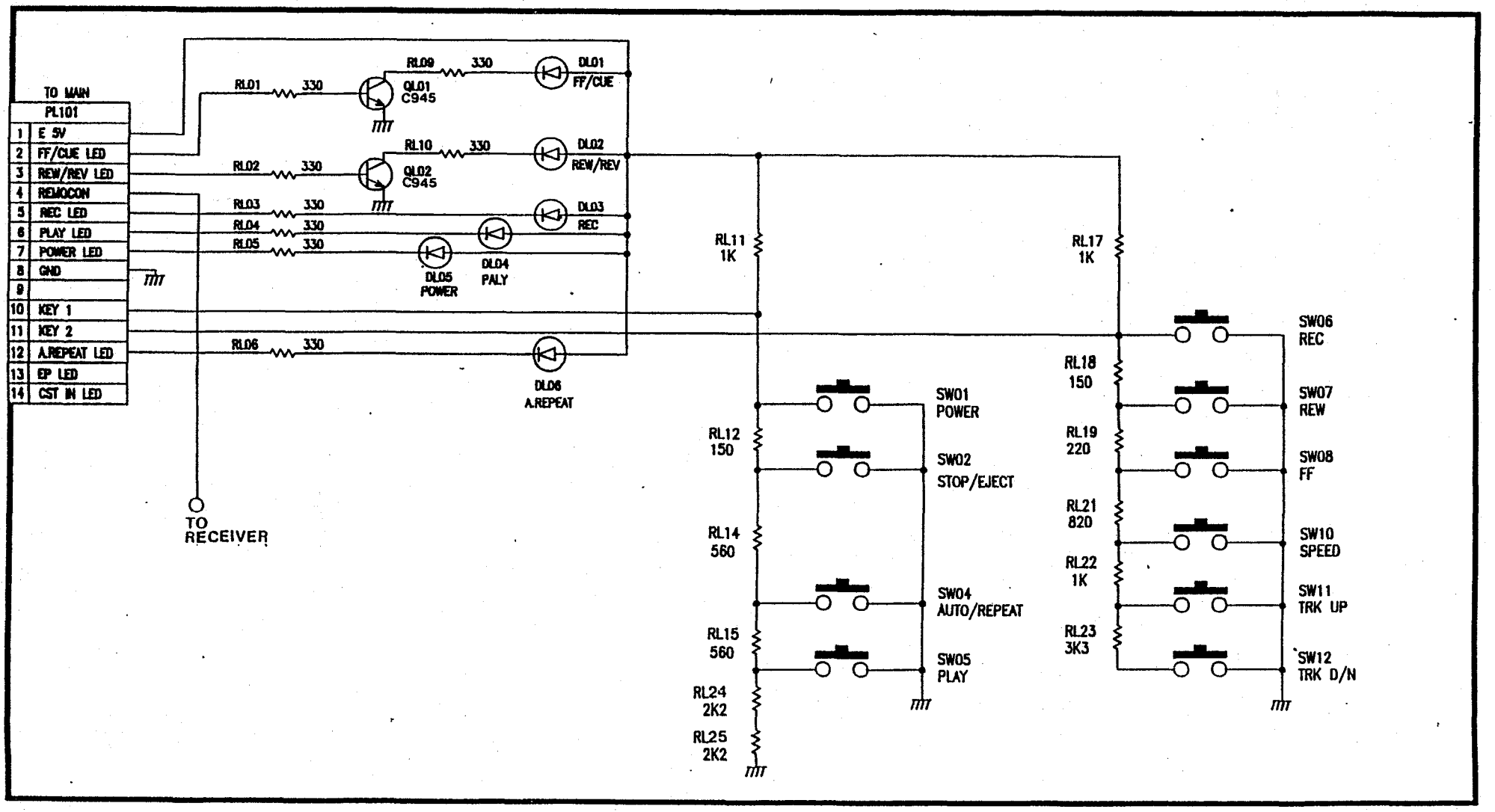
LA7391 : 42PIN
LA7390 : 36PIN



VDR PRE-AMP SCHEMATIC DIAGRAM



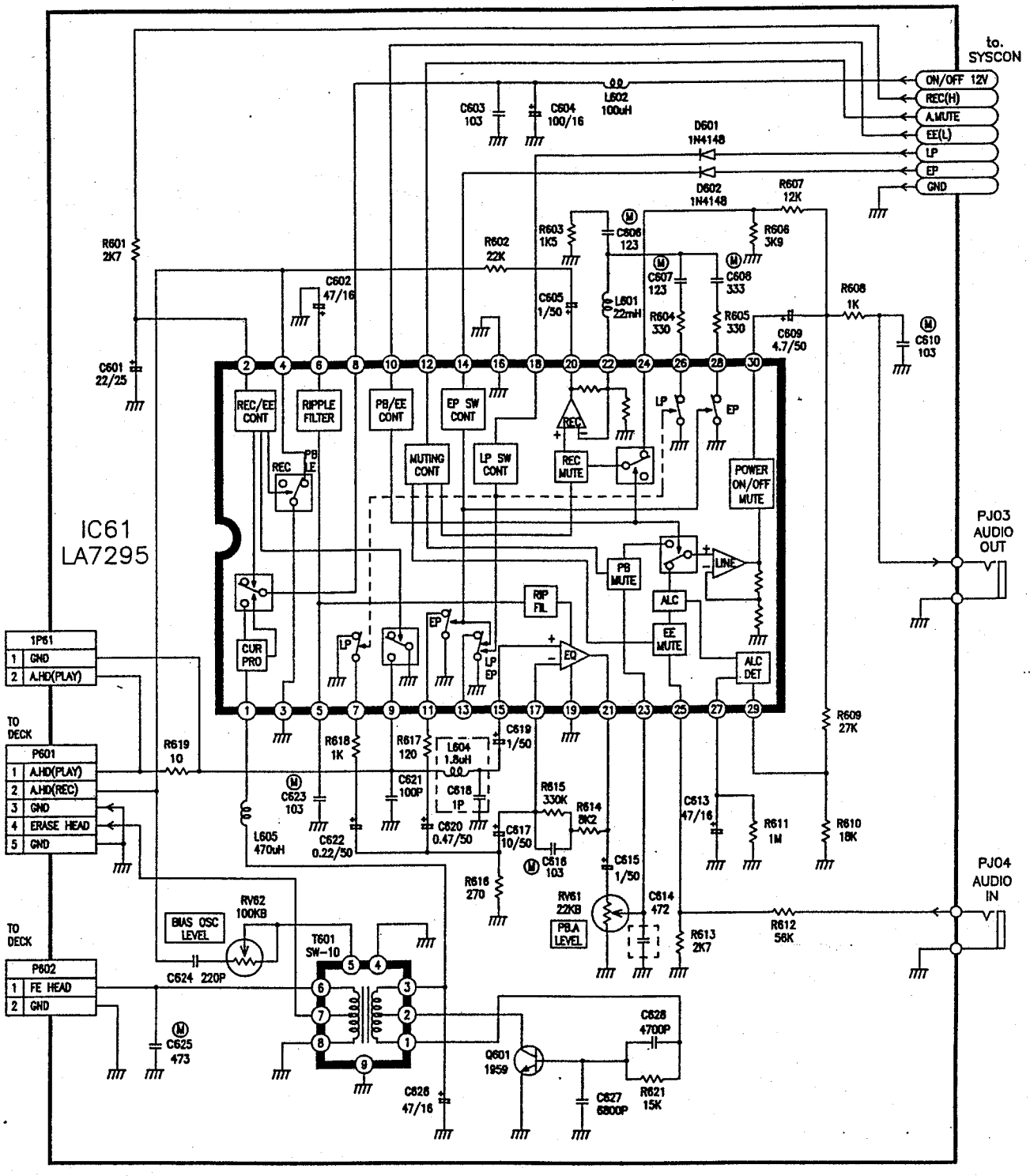
LOGIC SW circuit-diagram



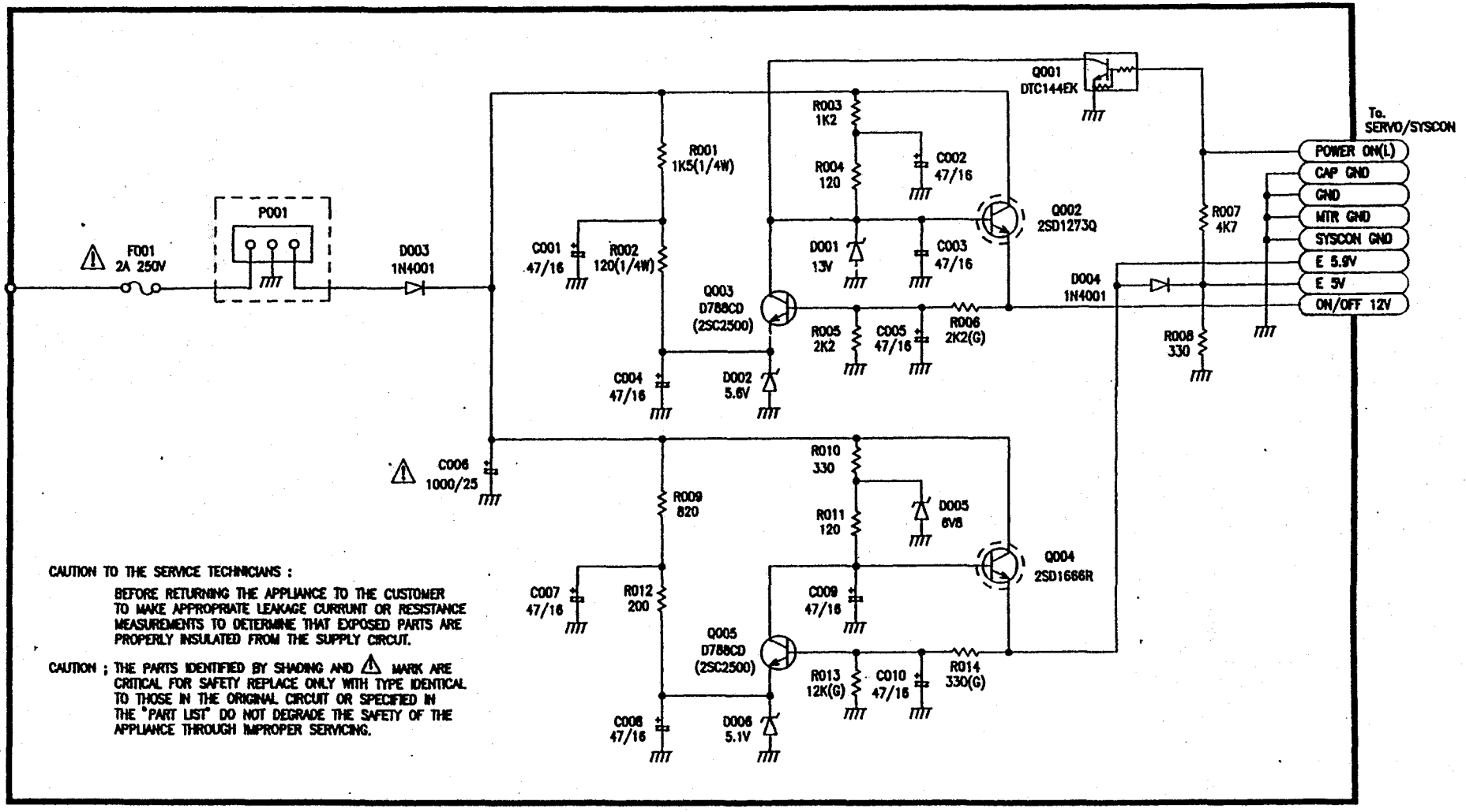
DATE : 1993/12/2				NAME	LOGIC SW PCB
REV	DRAWING	CHECKED	APPROVED		FULL SECTION
0	曾美華	洪金鳥	楊文王	MODEL	TVR-440
ACTION ELECTRONICS CO.,LTD.				SYSTEM	NTSC
				DWG.NO	05-H3-1101

(SH5) IN

VDR AUDIO SCHEMATIC DIAGRAM



VDR POWER SCHEMATIC DIAGRAM



CAUTION TO THE SERVICE TECHNICIANS :

BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER TO MAKE APPROPRIATE LEAKAGE CURRUNT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE PROPERLY INSULATED FROM THE SUPPLY CIRCUIT.

CAUTION ; THE PARTS IDENTIFIED BY SHADING AND ⚠ MARK ARE CRITICAL FOR SAFETY REPLACE ONLY WITH TYPE IDENTICAL TO THOSE IN THE ORIGINAL CIRCUIT OR SPECIFIED IN THE "PART LIST" DO NOT DEGRADE THE SAFETY OF THE APPLIANCE THROUGH IMPROPER SERVICING.

ALIGNMENT PROCEDURE

REGULATOR ADJUSTMENT

1.CONNECT TV UNIT TO AC 220V POWER.
SUPPLY & TEST PATTERN GENERATOR.

2.CONNECT A DC DIGITAL VOLTMETER OR OTHER PRECISION ACCURACY VOLTMETER TO THE EMITTER OF THE REQULATOR OUTPUT TRANSISTOR QPQ5 (OR ANY 12 VOLT POINT OR TP1).

3.VERTICAL HIGHTNESS ALIGNMENT
ADJUST THE VERTICAL HIGHTNESS VRV1 ENABLE THE CIRCLE OF PICTURE APPROACH TO CIRCLE.

4.VERTICAL POSITION ALIGNMENT
ADJUST VERTICAL POSITION VRV2, LET THE SQUARE SIGNAL IN THE CENTER OF THE SCREEN.

5.HORIZONTALL POSITION ALIGNMENT
ADJUST HORIZONTAL POSITION VRH1, LET THE SQUARE SIGNAL IN THE CENTER OF THE SCREEN.

6.RF AGC ALIGNMENT
ADJUST VIF MODULE AGC CONTROL VRI1, AT INPUT SIGNAL INTENSITY 50dB, THE SCREEN COULD LOOKING CLEAR AND 80dB THE SCREEN DON'T INFLECT.

7.WHITE BALANCE ALIGNMENT
ADJUST THE VRY4, VRY5, AT SENTER POSITION, ADJUST SCREEN VR, LET THE SCREEN WILL BE LITTLE BRIGHTNESS. ADJUST VRY4 LET THE SCREEN TO BE YELLOW, AND THEN ADJUST VRY5 LET THE SCREEN APPROACH TO WHITE.

8.FOCUS ADJUSTMENT
ADJUST FOCUS VR, LET THE STRIP ON THE SCREEN TO BE CLEAR.

GENERAL ALIGNMENT INSTRUCTIONS

1. VIDEO IF ALIGNMENT

TEST EQUIPMENT CONNECTION (SEE FIGURE)

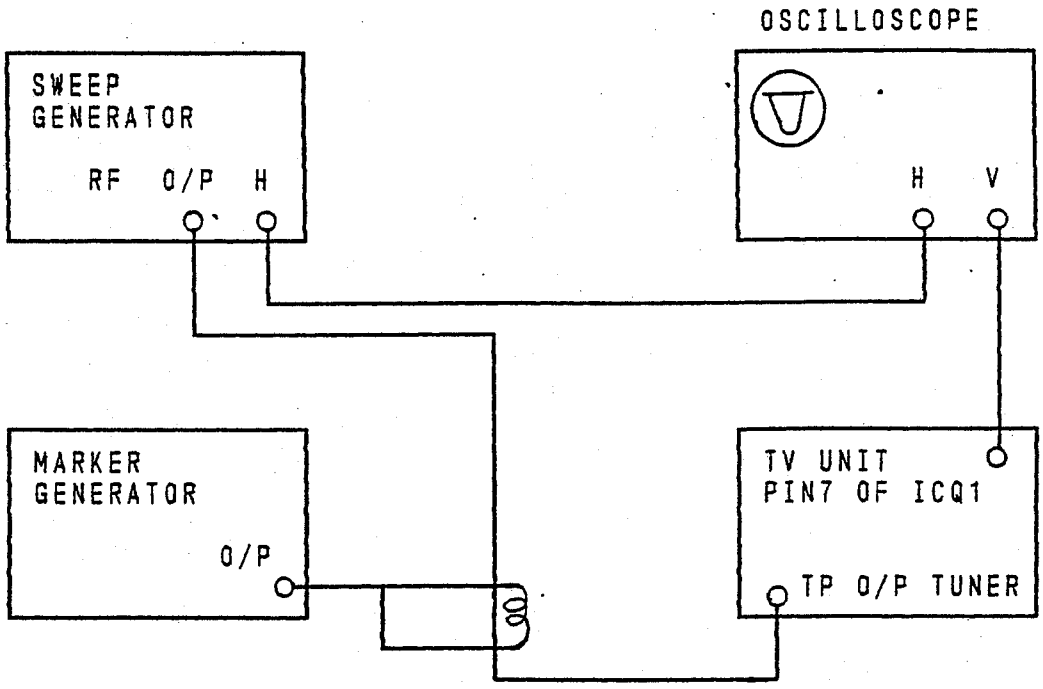
OSCILLOSCOPE: CONNECT TO ICQ1 PIN7.

SWEEP GENERATOR: CONNECT THROUGH A MATCHING PAD TO TEST POINT (TP3). OF THE TUNER.

MARKER GENERATOR: COUPLE LOOSELY TO THE OUTPUT CABLE OF SWEEP GENERATOR.

DC SUPPLY: ADD AC 220V POWER SUPPLY.

ADJUST SWEEP GENERATOR TO LOWEST SIGNAL LEVEL CONSISTENT WITH USABLE			
STEP	SWEEP FREQUENCY	MARKER FREQUENCY	REMARK
ADJUST VIF DETECTOR LI01 FOR MARKER POINT MAXIMUM.	30-50 MHZ FOR NTSC 65MHz FOR JAPAN). 25-45 MHZ FOR CCIR.	SYSTEM B,G,H, 36.7MHZ SYSTEM I 37.3 MHZ SYSTEM M,N 44MHZ (58.75MHZ FOR JAPAN) (34.7MHZ FOR AUSTRARIA SYSTEM)	PARENTHESIS FOR EXCEPTION.



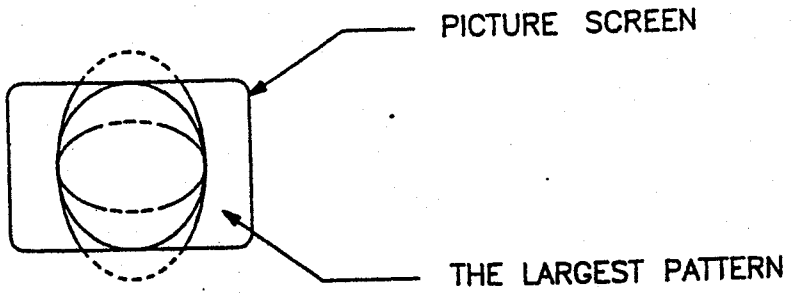
VIDEO IF ALIGNMENT CONNECTING FIGURE

(2) VERTICAL DEFLECTION ALIGNMENT

1. TUNE THE RECEIVER IN A TEST PATTERN.

2. ADJUST V-SIZE CONTROL VRV1 TO MAKE.

THE INSIDE OF THE LARGEST CIRCLE OF TEST PATTERN REACHES NEAR ROUND PATTERN. (SEE THE FIGURE).

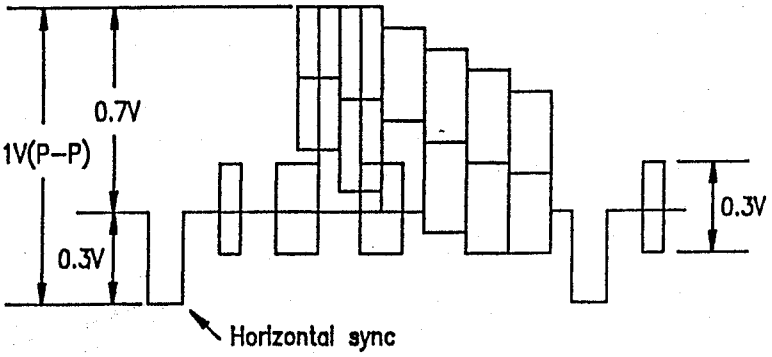


ELECTRICAL ADJUSTMENT

1-1. ALIGNMENT AND ELECTRICAL ADJUSTMENT

For these adjustment, use the equipment mentioned below and proceed by using the alignment tape and video signal.

The suitable waveform of the color-bar signal generator is shown below.



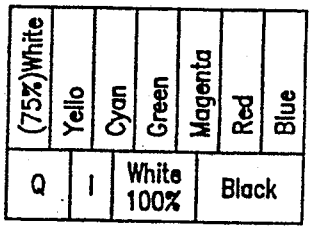
Color bar signal waveform

Instrument and Tools Required.

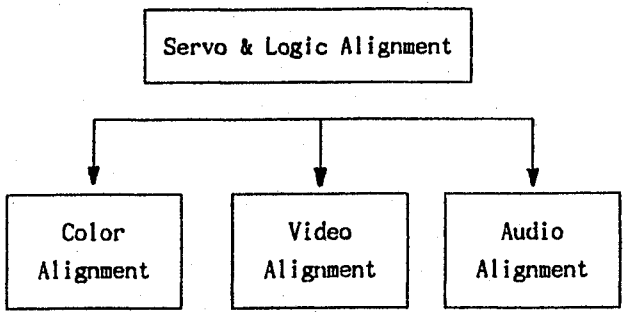
1. Color TV receiver.
2. Oscilloscope having 10MHz or more bandwiddh.
3. Color-bar generator.
4. Frequency counter.
5. VTVM
6. VOM
7. Audio oscillator.
8. Audio attenuator.

Signal Level and Input and Output Impedance Requirement.

1. Video input: Negative sync., 1Vp-p standard composite video signal, 75Ω.
2. Video output: Same as above.
3. Audio input: Line - 10dBs, 47KΩ.
4. Audio output: -50dBs, 10KΩ or less.



Color bar pattern



Adjustment Sequence

The VCR should be adjusted in the sequence shown below.

1-2. SERVO-LOGIC CIRCUIT ADJUSTMENT METHOD

1. VIDEO HEAD SWITCHING POSITION

Adj.Location	Checking Point	Measuring Equipment	Mode	Test Tape
RV11	PT01 3PIN TP54	Oscilloscope	Play	DP-1

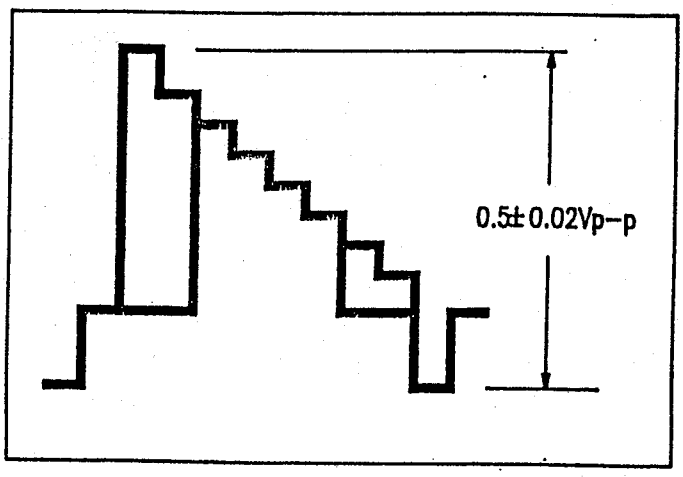
1) Play back the test tape.
2) Set the oscilloscope in the CHOP mode connect the CH1 to SW pulse PT01 2 PIN the CH2 to TP54 (v.out) with CH1 triggering.
3) Adjust RV11 for the positive trigger until 6.5H±0.5H cycles before the vertical SYNC pulse.

1-3. VIDEO CIRCUIT ADJUSTMENT METHOD

1. E E VIDEO LEVEL

Adj.Location	Checking Point	Measuring Equipment	Mode	Test Tape
RV55	TP55	Oscilloscope	EE	—

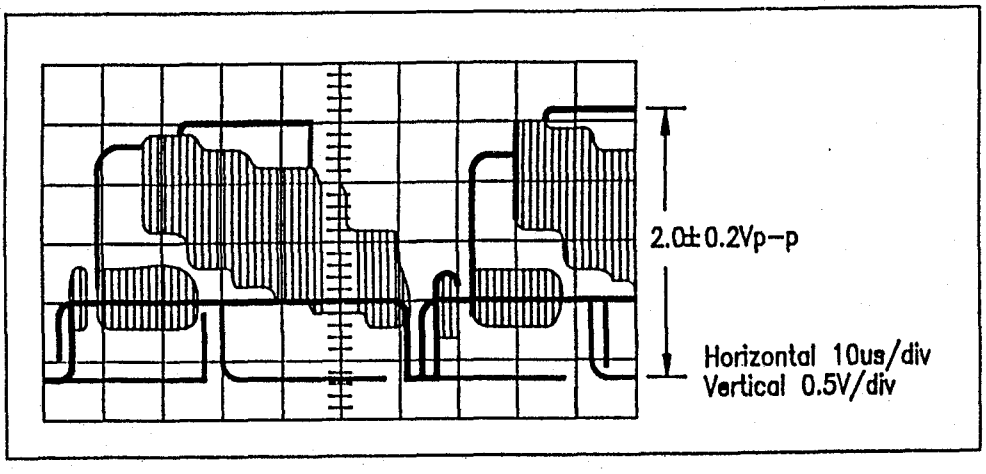
1) Feed the color bar signal to the line input terminal. And set for the stop (EE) mode.
2) Connect the oscilloscope to TP55 and trigger the scope with a composite SYNC signal at TP53. (COMP.SYNC.)
3) Adjust the oscilloscope so that it can display a waveform of approx.2H.
4) Adjust RV55 to obtain 0.5±0.02Vp-p between SYNC TIP and 100% white level.



2. PLAYBACK Y-SINGAL OUTPUT LEVEL

Adj. Location	Checking Point	Measuring Equipment	Mode	Test Tape
RV56	TP54	Oscilloscope	PB	DP-1

1) Playback the test tape (Color Bar Singal).
2) Connect the oscilloscope to TP54 and trigger the scope will a composite SYNC signal at TP53. Adjust the scope so that it can display a waveform of approx. 2H.
3) Adjust RV56 to optain 2.0±0.2 Vp-p between the SYNC TIP and 100% white level.



3. SYNC TIP FREQUENCY

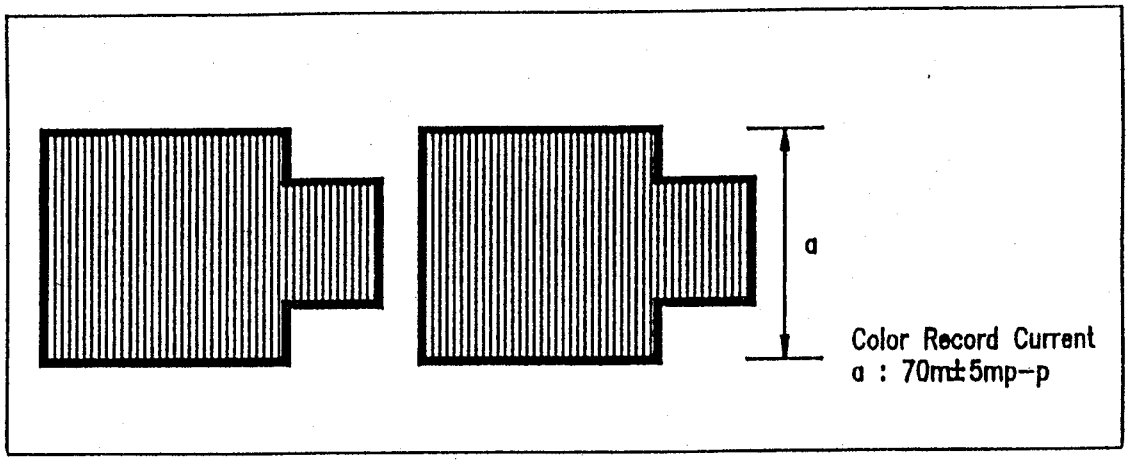
Adj. Location	Checking Point	Measuring Equipment	Mode	Test Tape
RV54, RV53	TP52	Freq. Counter	REC.	—

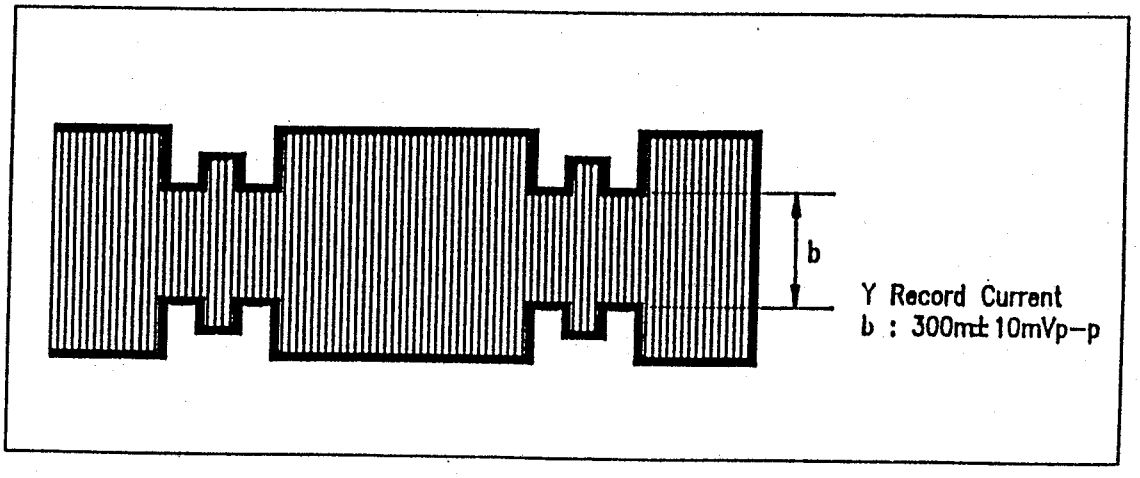
1) Set the unit to NTSC mode without video signal. (Jack of video line input is shorted with ground).
2) Connect the frequency counter to TP52.
3) Adjust RV54 until the SYNC TIP frequency becomes 3.4MHz±0.1MHz.
4) Set the unit to N-PAL mode.
5) Adjust RV53 until the SYNC TIP frequency becomes 3.8MH±Z0.1MHZ.

4. LUMINANCE AND COLOR RECORD CURRENT

Adj.Location	Checking Point	Measuring Equipment	Mode	Test Tape
RV51, RV52	TP51	Oscilloscope	REC.	Blank Tape

1) Input Color bar signal in video line in.
2) Make every adjustment in REC mode.
3) Connect CH.1 of oscilloscope to TP51 and TP GND and CH.2 TP53 (C.SYNC), and then trigger the scope with an external signal.
4) Adjust RV52 Until the color record current level (RED REFERENCE) becomes 70±5mVp-p.
5) Connect CH.1 of oscilloscope to TP51 and TP GND and CH.2 TP53 (C.SYNC), and then trigger the scope with an external signal.
6) Adjust RV51 Until the Sync. Luminance level becomes 300±10mVp-p.

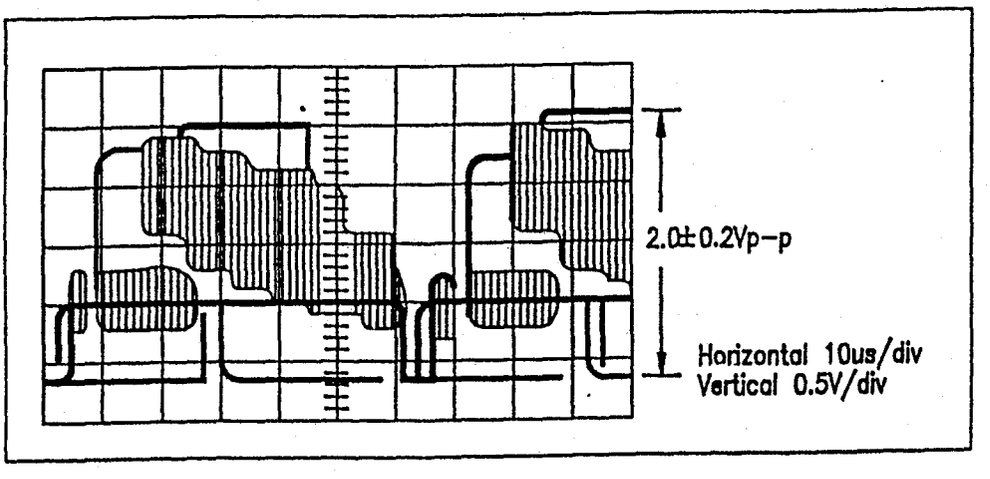




5. FM DEVIATION

Adj. Location	Checking Point	Measuring Equipment	Mode	Test Tape
RV57	TP54	Oscilloscope	PB & REC	Blank Tape

1) Confirm that the adjustment for the playback Y-Singal output level fas been made corretly.
2) Feed the color bar signal to the line terminal, and set the VCR to the record mode.
3) Connect the oscilloscope to TP54 and trigger the scope with a composite sync signal (TP51).
4) Record the color bar signal for a few minute and playback it. Then confirm that the playback Y-signal output level is 2.0±0.2Vp-p.
5) If the playback Y signal output level is not 2.0±0.2 Vp-p, the adjust as follows.
   5-1) Set the VCR in the record mode.
   5-2) Turn the variable RV57 a little.
   5-3) Record the color bar signal for a few minute and playback it.
   5-4) Confirm the playback Y signal output is 2.0±0.2 Vp-p.
   5-5) Repeat from step 5-1) until the playback Y-signal oytput level become 2.0±0.2 Vp-p between the Sync. TIP and 100% white level.



1-4. AUDIO CIRCUIT ADJUSTMENT METHOD

1. PLAYBACK OUTPUT LEVEL

Adj.Location	Measuring Point	Measuring Equipment	Condition of Adj.	Test Tape
RV61	Audio Line Out	Audio Level Meter	PLAY Mode	DP -1

1) Connect the audio level meter to the audio line output jack.
2) Play back the test tape.
3) Adjust RV61 until the audio level meter reads -6.0±1.5dBm play back output.

2. PLAYBACK OUTPUT FREQUENCY CHARACTERISTIC

Adj.Location	Measuring Point	Measuring Equipment	Condition of Adj.	Test Tape
Checking	Audio Line Out	Audio Level Meter	PLAY Mode	1KHz, 0dBm 6KHz, 0dBm

1) Playback the Test tape, and confirm that the playback output level at 6KHz is within 0±3dB as referenced to the 1KHz Playback output level.

3. BIAS CURRENT ADJUSTMENT AND OSCILLATION FREQUENCY CHECKING

Adj.Location	Measuring Point	Measuring Equipment	Condition of Adj.	Test Tape
RV62	TP61 1.2pin	Frequency Counter	REC. Mode	Blank Tape

1) Supply the signal in the OPEN mode.
2) connect the positive lead of the VTVM to TP61 1pin and negative lead to TP61 2pin.
3) Set the VCR in recording mode.
4) Confirm the frequency counter display is 70KHz±10% and adjust RV62 until VTVM reads 2.3 mVrms.

4. RECORD-PLAYBACK FREQUENCY RESPONSE

Adj.Location	Measuring Point	Measuring Equipment	Condition of Adj.	Test Tape
Checking	Audio Line Out	Audio Level Meter Audio Signal Generator	REC. Play	Blank Tape

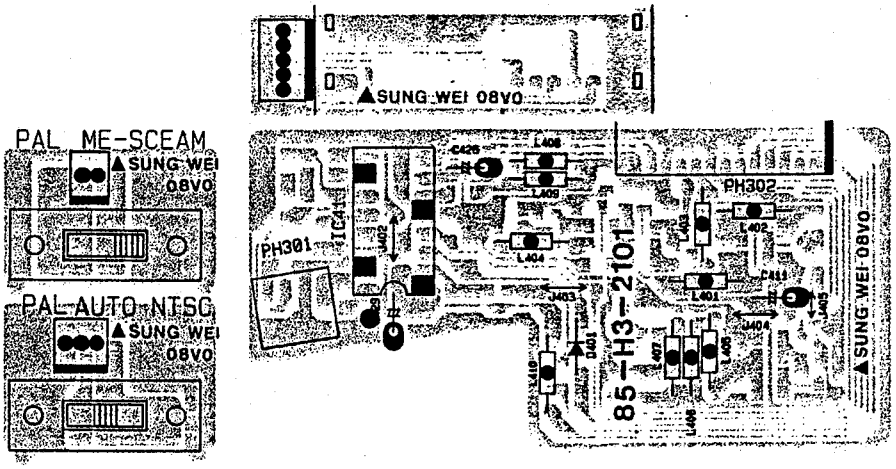
1) Connect the audio signal generator to the audio line input jack, and the audio level meter to the audio line output jack.
2) Record reference audio signal to the 400Hz and 8KHz (SP) audio signal at-20 dBs.
3) Check to insure that 8KHz and playback output level is within -1±3 dB as referenced to the 400 Hz playback output level. (SP)
4) If the difference between 8KHz and 400Hz playback output level is more than +1 dB, increase the bias current more than 2.3mVms, and if the difference is less than -3dB, reduce the bias current less than 2.3mVms.

5. RECORD-PLAYBACK OUTPUT LEVEL

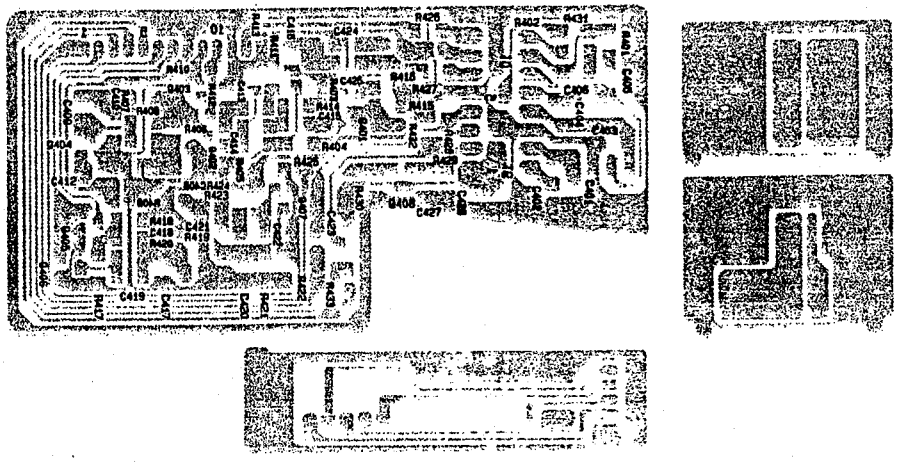
Adj.Location	Measuring Point	Measuring Equipment	Condition of Adj.	Test Tape
Checking	Audio Line Out	Audio Level Meter Audio Signal Generator	REC. Play	Blank Tape

1) Connect the audio signal generator to the audio line input jack.
2) Record and playback the input of the audio reference signal 1KHz, -10dBm.
3) Connect that play output level is -5±3dBm as referenced to the playback output level.

VDR HEAD AMP P.C.B TOP VIEW



VDR HEAD AMP P.C.B BOTTOM VIEW

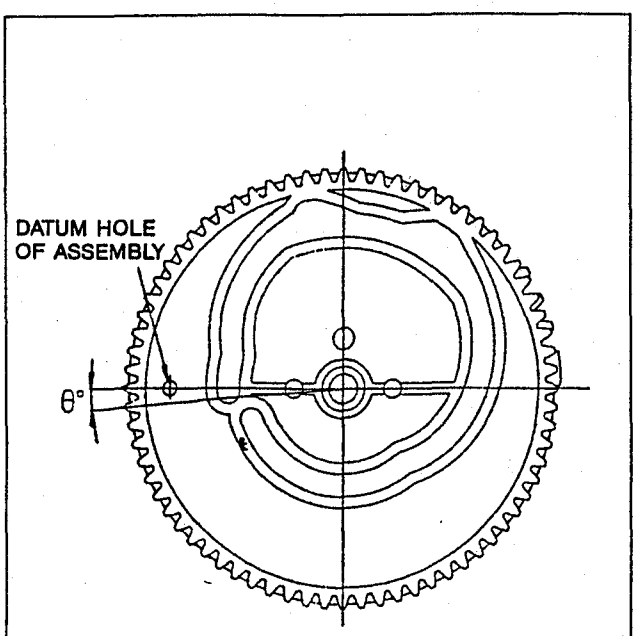


1. MECHANICAL ADJUSTMENT

1-1. CHECK FOR THE MECHANICAL POSITION

Check for the following matters before disassembly, replacement and reassembly.

1) Make sure of the assembly base of the Deck Mechanism in the EJECT MODE.
2) Make sure of the assembly position among the Cam Gear and several parts before assembling the L/C Bracket Total Ass'y (refer to Fig. 1-1,2,3,4).
3) Make sure of the assembly position between the Loading Rack and the R & L-Loading Ass'y (refer to Fig. 1-5).
4) Make sure of the position of the Cam Switch when assembling the L/C BRKT Total Ass'y (refer to Fig. 1-6).
5) Make sure of the assembly state of the Front Loading Ass'y (refer to Fig. 1-7).
6) Make sure of the other's assembly state (refer to Fig. 1-8).



*Note: Datum hole of assembly should be located in $\theta = 0 \sim 5°$.

Fig. 1-1 Reference of assembly for the Cam Gear

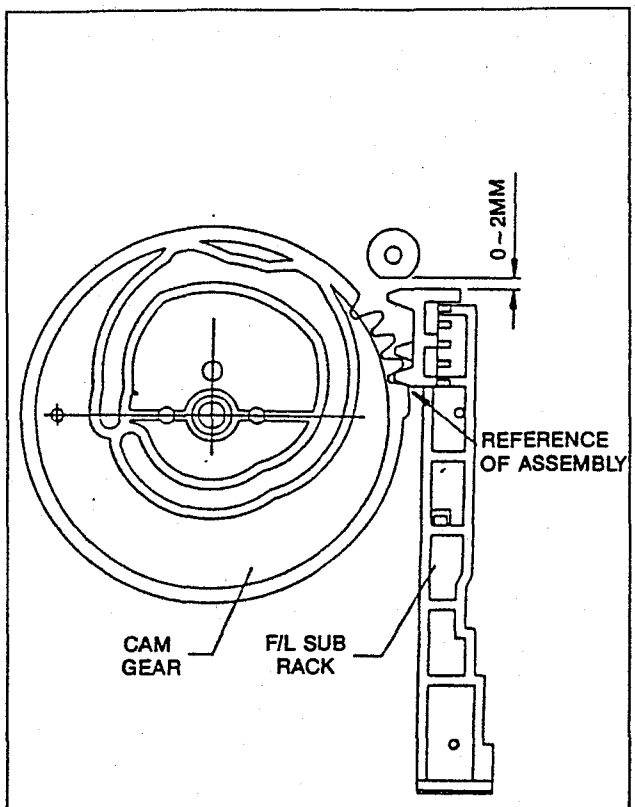


Fig. 1-2 Reference of assembly for the F/L Sub Rack and Cam Gear

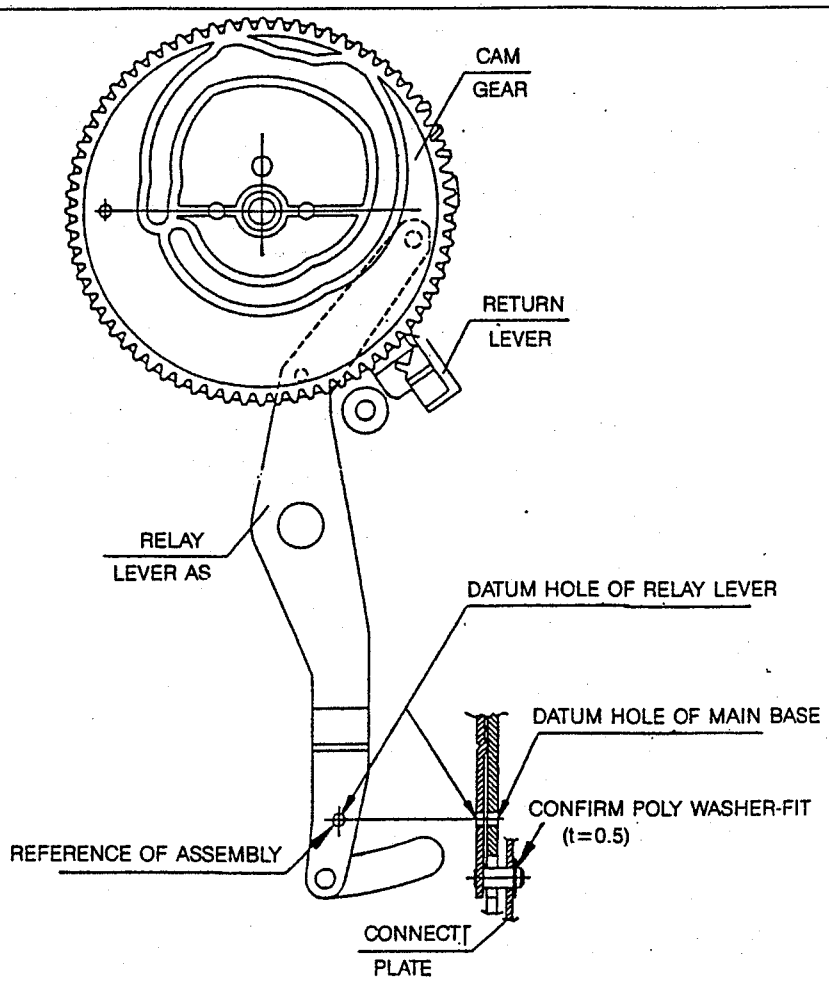


Fig. 1-3 Reference of assembly for the Cam Gear and Relay Lever

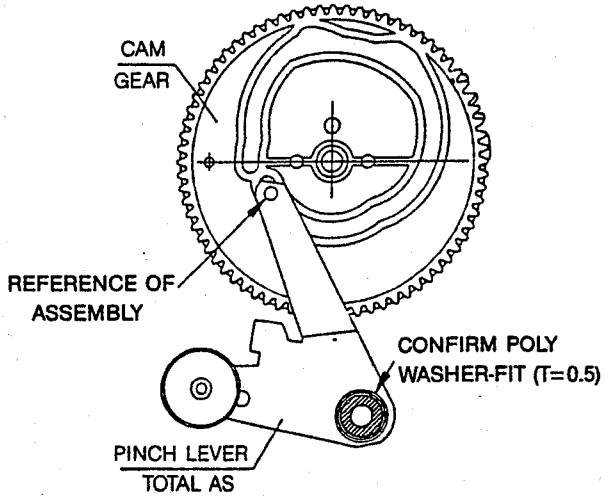


Fig. 1-4 Reference of assembly for the Cam Gear and Pinch Lever

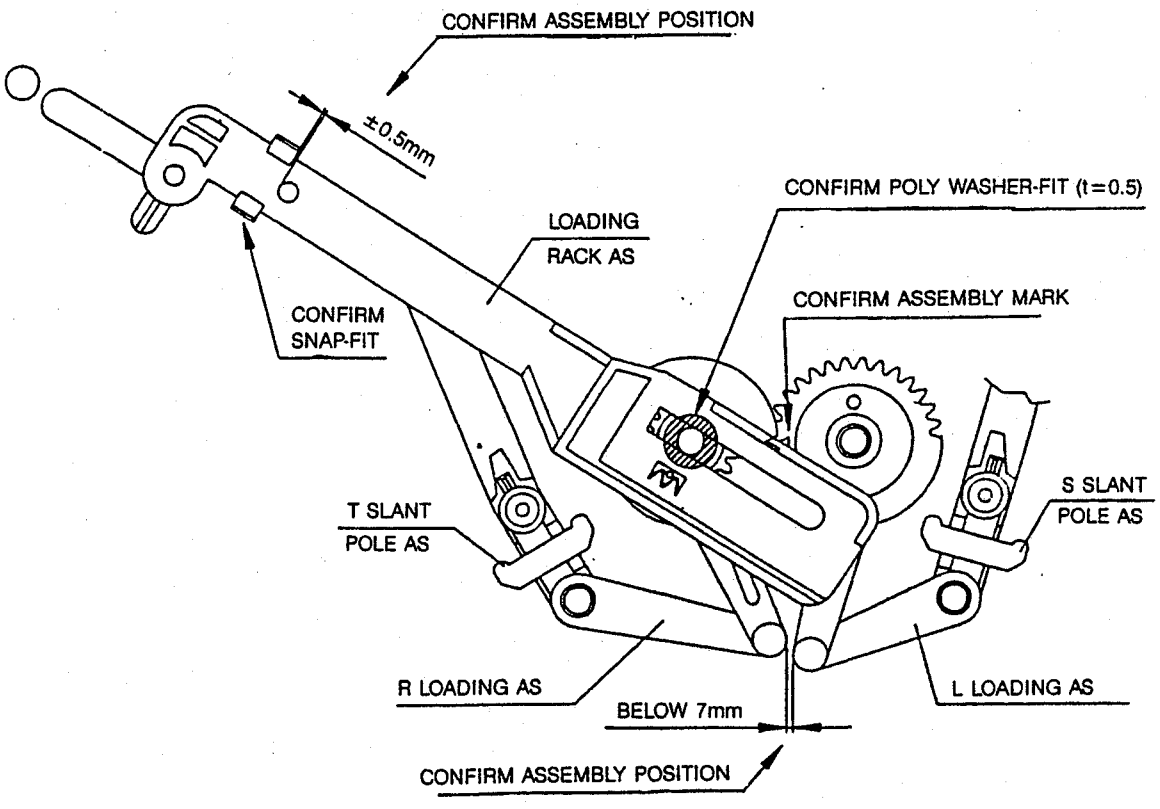


Fig. 1-5 Reference of assembly for the Loading Rack and R/L Loading AS

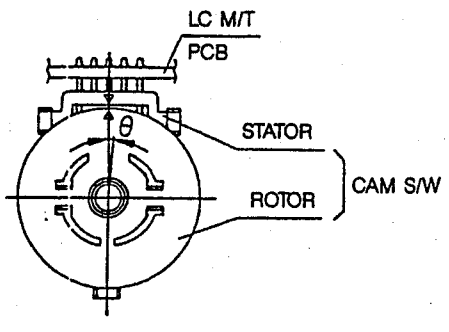


Fig. 1-6 Reference of assembly for the Cam Switch

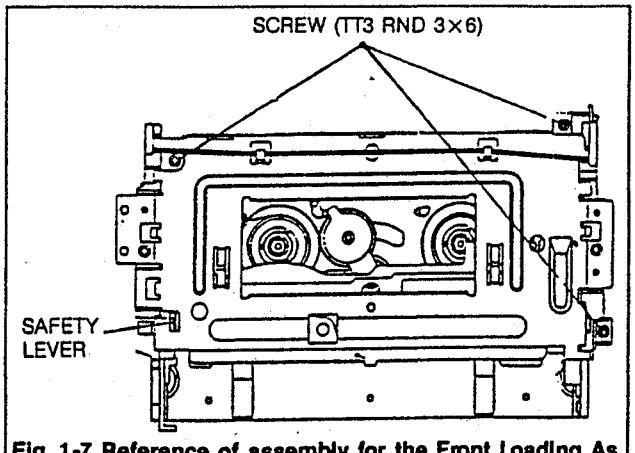


Fig. 1-7 Reference of assembly for the Front Loading As

***Note:** 1. The △ Shape of Rotor should be located in $\theta = 0 \sim 5°$.
2. The above figure is a reference bottom view for the L/C bracket Total AS.

***Note:** 1. It should be returned to its original state when the safety lever was pushed by hand.
2. On fastening screw, that above 6mm should not be used (In the case of using non-specification screw, the Capstan PCB is deformed.)

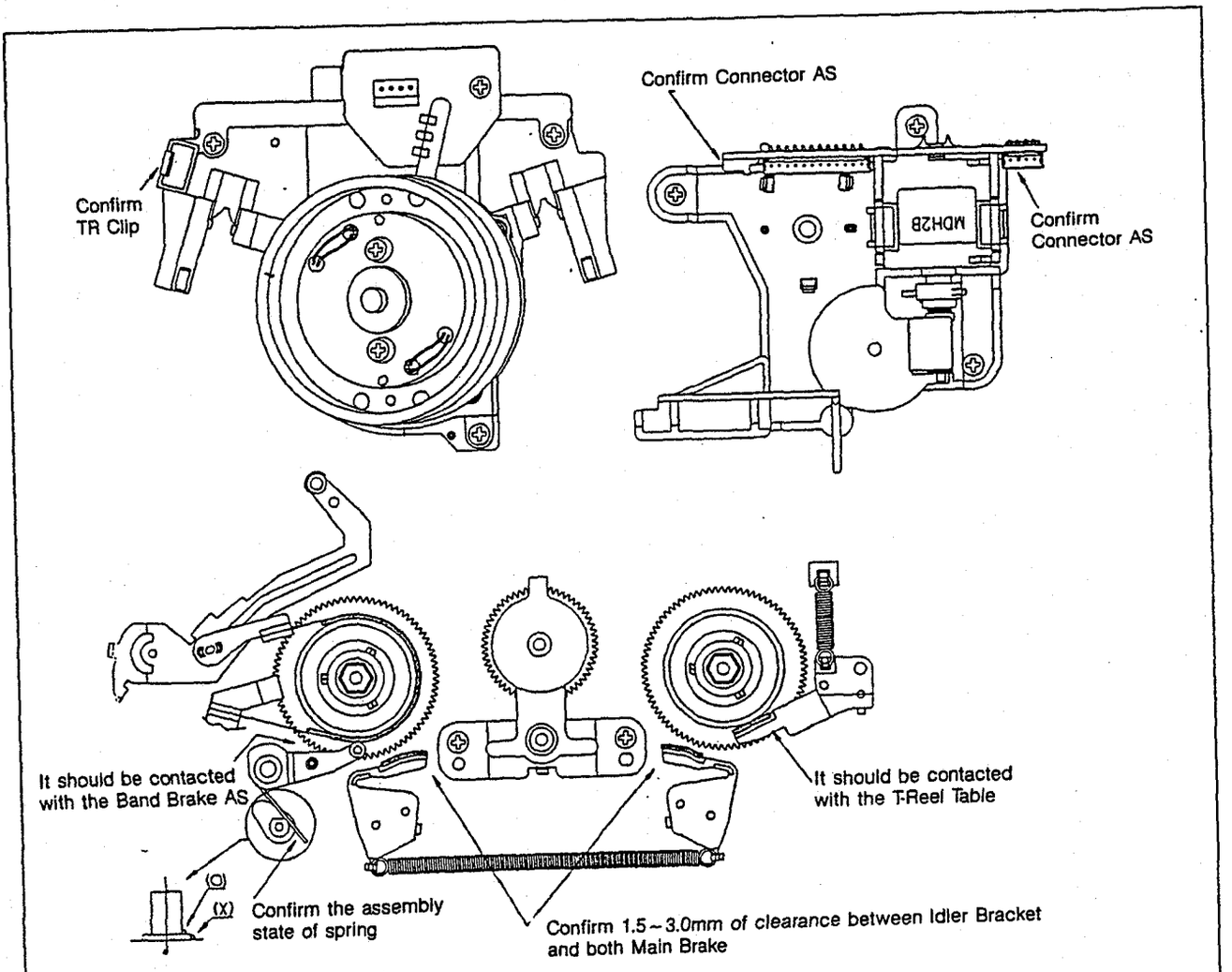


Fig. 1-8 Reference of assembly for the other parts

1-2. HOW TO SET MECHANICAL MODE

1) On removing the Front Loading Ass'y, Syscon executes the INITIAL MODE and then power off.
2) If the power is on in the INITIAL MODE, it executes the STOP MODE.
3) Push the button you want.
4) On executing the required mode, pull out the power plug if necessary.
5) If the STOP/EJECT button is pushed in the STOP MODE or EJECT MODE, it returns to the INITIAL MODE via the EJECT mode and then power off.
6) Reassemble the Front Loading Ass'y in the only EJECT MODE.

1-3. Measurement of Pressing Force for Pinch Roller

1) In a state of removing th Front Loading Ass'y, pull out the power plug after playing back without cassette.
2) Remove the L/C Bracket Total Ass'y and the Worm Wheel.
3) Pull the push-pull gauge to the direction 'A' indicated by the arrow as shown in Fig. 1-9.
4) Confirm that the scale of push-pull gauge is 1.2±0.2 Kg at the moemnt of the Pinch Roller separating from the Capstan Shaft.
5) If it is out of specification, replace the Pinch Roller Spring or the Pinch Lever Total Ass'y.

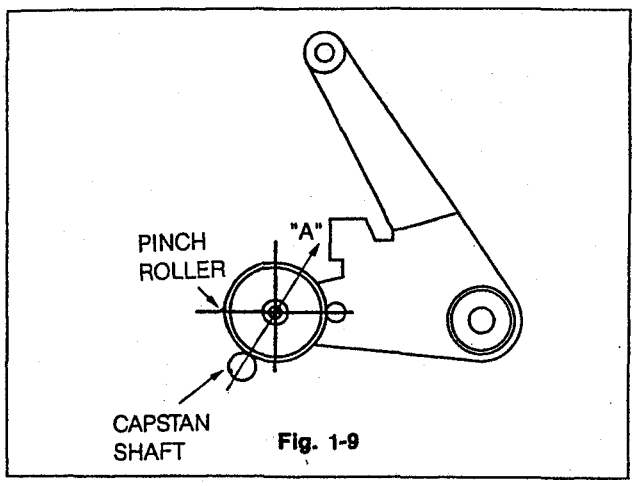


Fig. 1-9

1-4. The Measurement and Adjustment of Back Tension

1) Play back T-120 tape at its center position without F/L Ass'y, wait until the driving of tape is stabilized (about 10~20 seconds).
2) Set the Tentelometer as shown in Fig. 1-10 and confirm the scale (SPEC: 22~30g).
3) If it is out of specification, change the position of Tension Spring in order to adjust the tension value.

NOTE:

1. Make sure that the three probes of the Tentelometer are all in good contact with tape.
2. It is recommended to be measured three times as Tentelometer is very sensitive.

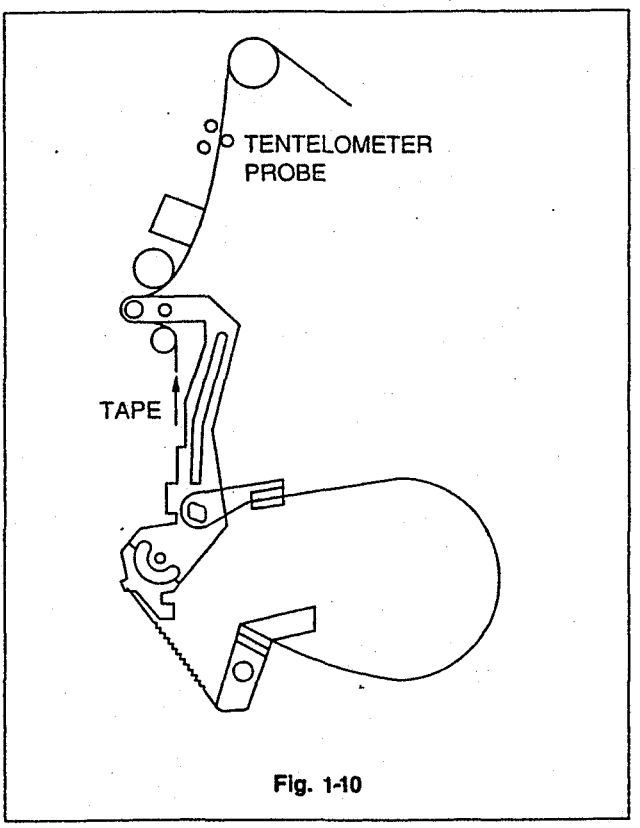


Fig. 1-10

1-5. The Height Adjustment of Reel-Table

1) Put the master into the Hole S and the Hole T in the Jig (TSH-V4) and set the Dial Gauge to zero.
2) Set the Jig (TSH-V4) on the Deck Ass'y as shown in Fig. 4-11 and check the height of Reel Table (S: 0±0.1 T: $0^{-0.05}_{-0.20}$)
3) If it is out of range, it is necessary to adjust the height of Reel Table by adding or subtracting the Poly Slider as shown in Table 1-1.

THICKNESS	PART NUMBER
0.13 mm	97S3903700
0.25 mm	97S3904000
0.5 mm	97S3903600

Table 1-1 Poly Slider for Adjustment

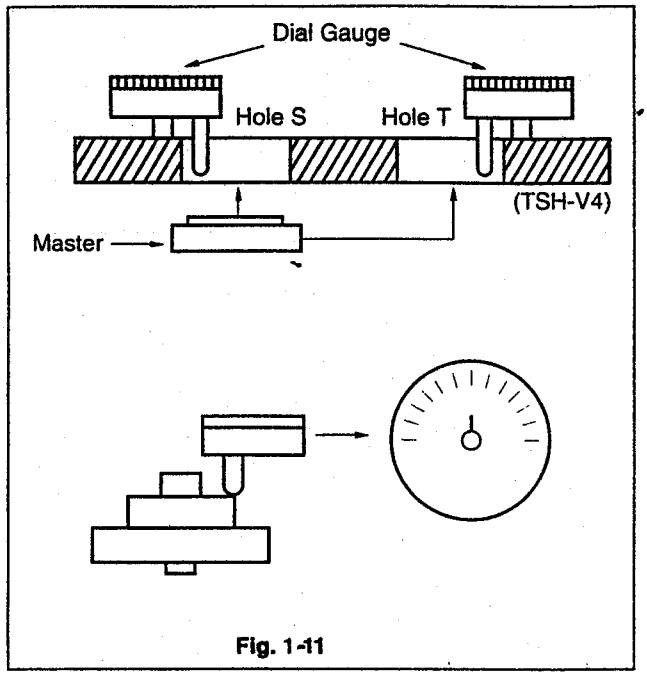


Fig. 1-11

1-6. The Measurement of Reel Torque

1) Play back the Cassette Type Torque Meter.
2) Measure the Take-up Reel Torque after the tape running is stabilized (SPEC: 90 ~ 170 cm).
3) If it is out of range, replace the Reel Gear Total Ass'y.

2. THE ADJUSTMENT OF TAPE TRANSPORTING SYSTEM

The tape transporting system has been precisely adjusted at the factory and does not ordinary require readjustment. But when the noise and tape damage takes place and parts that compose the tape transporting system are replaced due to troubles by long usage or unexpected accidents, check and readjust the tape transpoting system.

2-1. THE SCHEMATIC DIAGRAM OF TAPE TANSPORTING SYSTEM

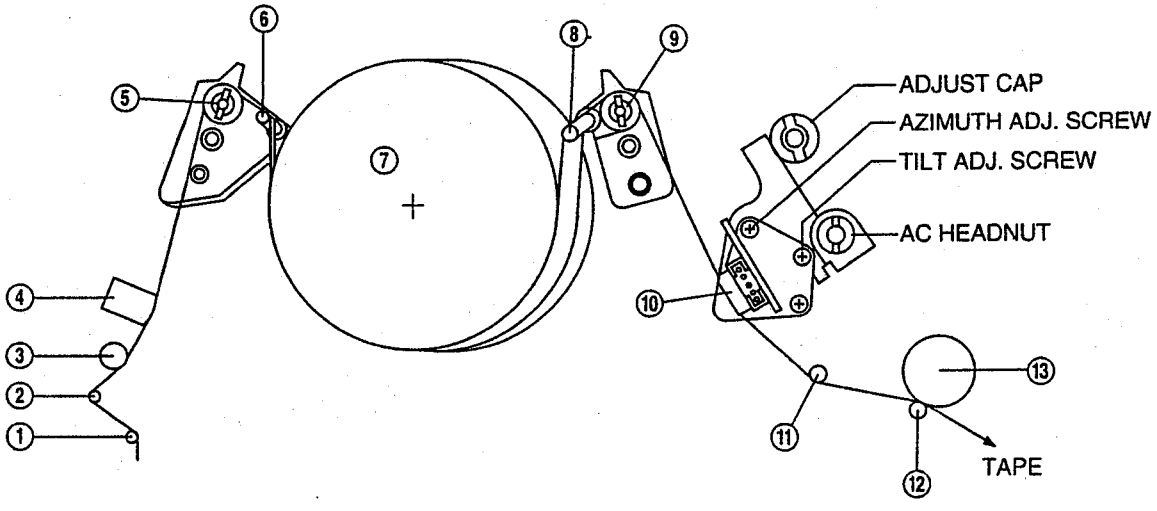
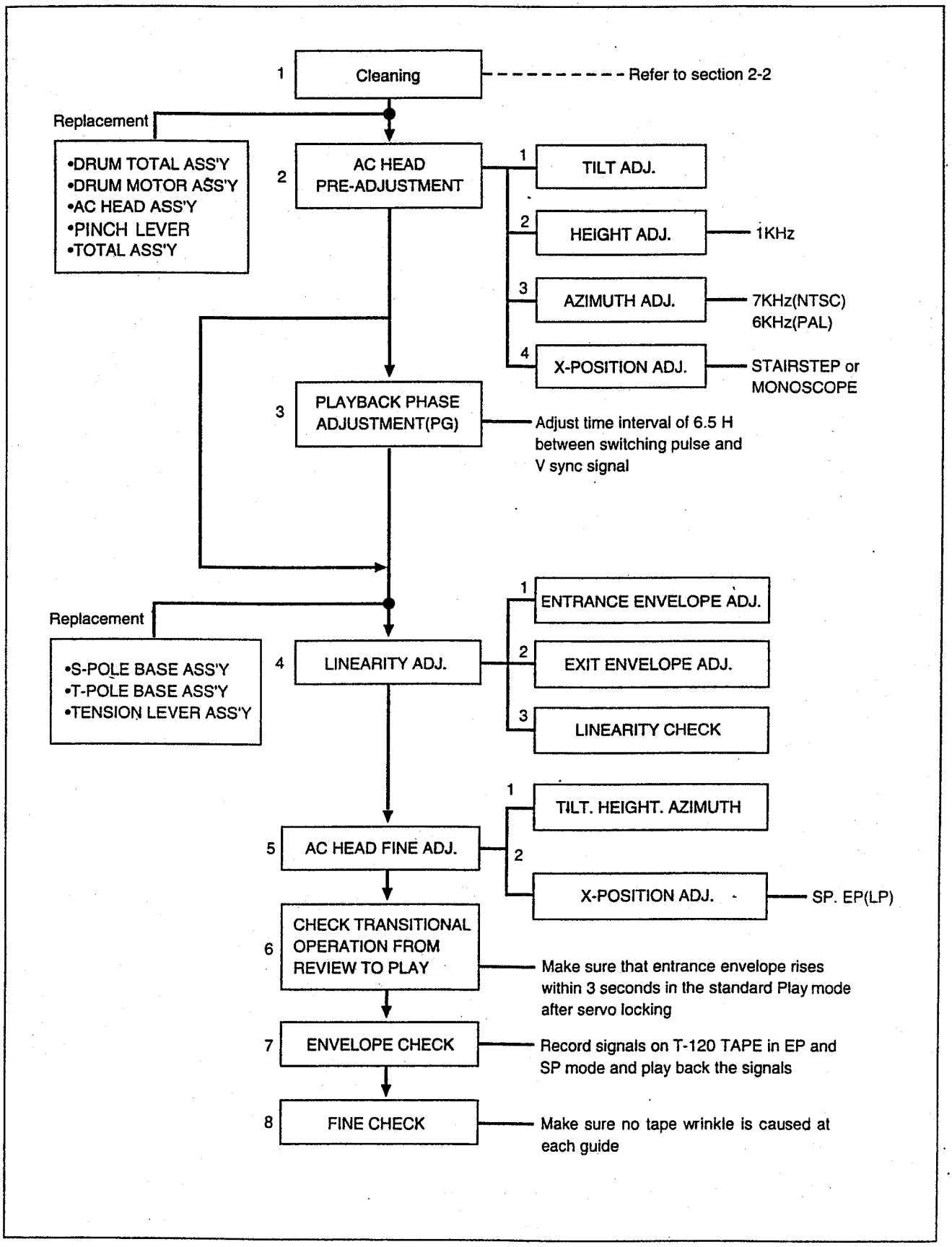


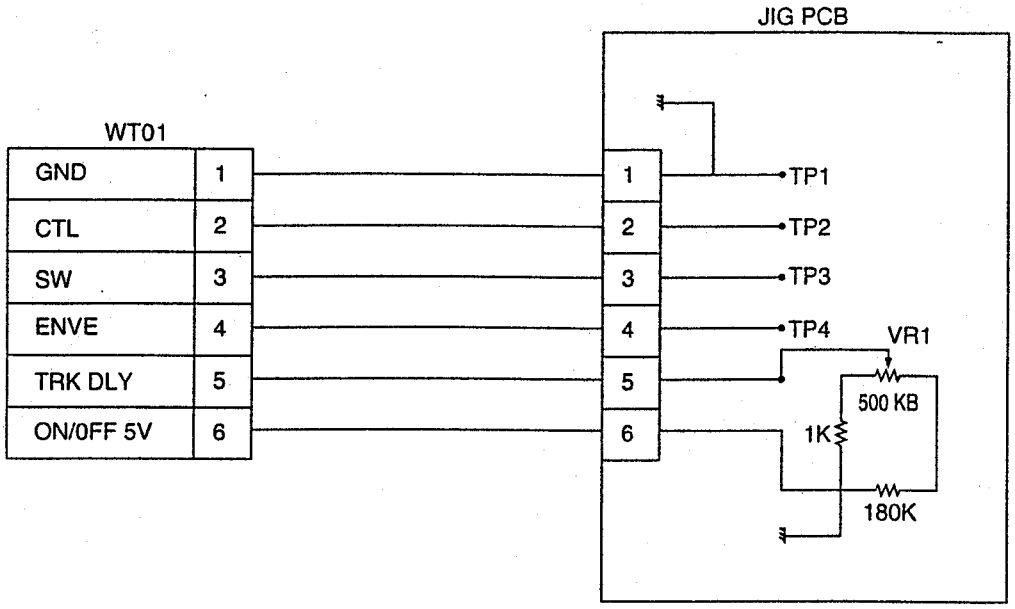
Fig. 2-1

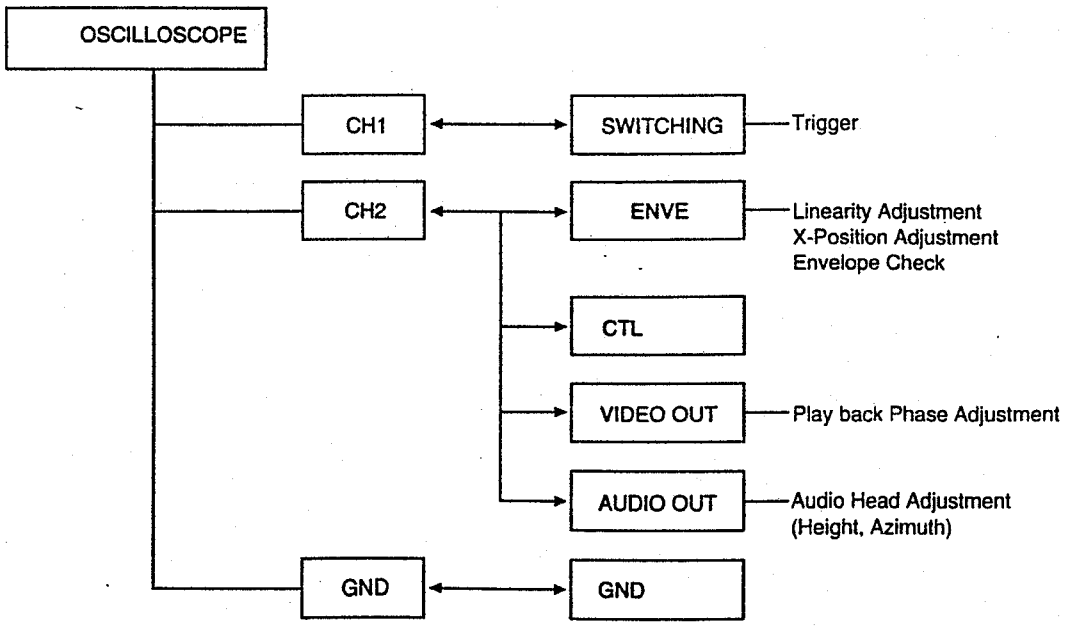
① VERTICAL POST
② TENSION POLE
③ S-GUIDE POST
④ FE HEAD
⑤ S-GUIDE ROLLER
⑥ S-SLANT POLE
⑦ CYLINDER
⑧ T-SLANT POLE
⑨ T-GUIDE ROLLER
⑩ AC HEAD
⑪ T-GUIDE POST
⑫ CAPSTAN SHAFT
⑬ PINCH ROLLER

2-2. ADJUSTMENT FLOW FOR THE TAPE TRANSPORTING SYSTEM

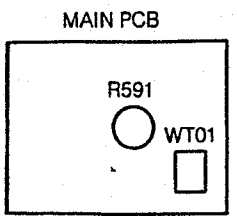


CONNECTION





ADJUSTMENT VR	REMARK
MAIN TRACKING VR PG VR	VR1 (JIG PCB) R591 (MAIN PCB)



2-3. ADJUSTMENT PROCEDURES

1) Pre-adjustment

When the parts as shown in Fig. 2-1 is replaced, the Tape Path may be changed and alignment tape may be damaged. To prevent this, first, playback a T-120 Tape and make sure excessive tape wrinkle does not occur at each tape guide.

If tape wrinkle is observed at the S & T-Guide Rollers (⑤, ⑨) in Fig. 5-1, turn the S & T-Guide Rollers for no wrinkle.

2) The Pre-adjustment of AC Head Ass'y

A. Tilt Adjustment
   a. Play back a T-120 Tape and observe running condition of the Tape at the upper and lower Flanges of the T-Guide Post Ass'y ⑪ in Fig. 2-1.
   b. Adjust the Tilt Adjusting Screw until tape runs stable as shown in Fig. 5-2.

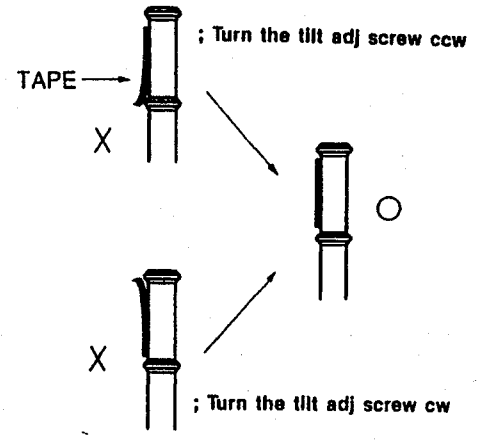


Fig. 2-2 T-Guide Post

B. Audio Azimuth Adjustment
   a. Play back the Alignment Tape (SP mode) with audio singal.
      • NTSC: 7 KHz • PAL: 6 KHz
   b. Observe audio signals on an oscilloscope.
   c. Turn the Azimuth Adjusting Screw to obtain maximum audio output.

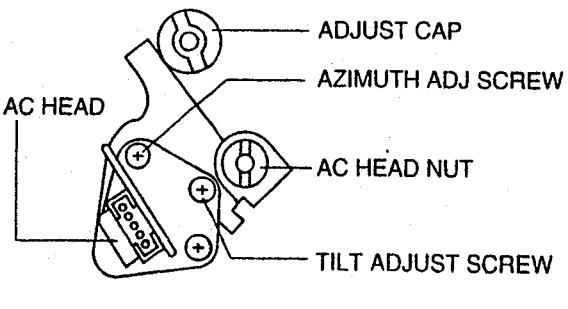


Fig. 2-3

C. The height Adjustment of AC Head
   a. Play back the Alignment Tape (SP mode) with 1 KHz audio singal.
   b. Turn the Ac Head Nut to obtain maximum audio output.

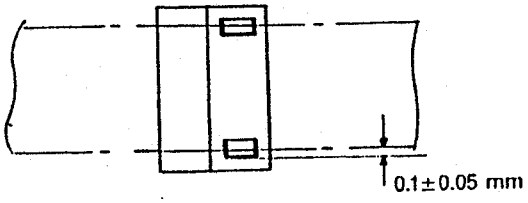


Fig. 2-4 The Height Adjustment of AC Head

D. The X-position Pre-adjustment of AC Head
   a. Play back the Alignment Tape with SP stairstep (or monoscope) singal.
   b. Adjust the Adjust Cap for maximum envelope output, after Tracking Volume is set at its center click position.

NOTE:
Before proceeding with this adjustment, remove locking paint applied on the Adjust Cap.

3) Playback Phase Adjustment (PG Adjustment)

A. Play back the Alignment Tape (SP mode).
B. Observe a video signal on an oscilloscope display triggered with the switching pulse.
C. Adjust the PG volume for time interval of 6.5 H±0.5 H between switching pulse and V sync signal.

NOTE:
In this adjustment, adjust the Tracking Volume the best video signal.

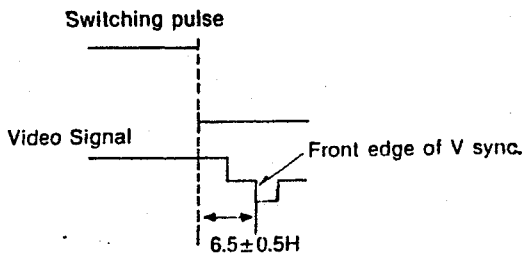


Fig. 2-5 Playback Phase Adjustment

4) Linearity Adjustment

A. Play back the Alignment Tape with SP stairstep (or monoscope) signal.
B. Observe the singal envelope on an oscilloscope display triggered by the switching pulse.
C. Make sure the envelope waveform (in its maximum) output meets the specifications shown in Fig. 2-6.
   a. Maximum output of envelope.
   b. Minimum output of envelope at the Drum entrance
   c. Minimum output of envelope at the Drum center.
   d. Maximum output of envelope at the Drum exit in Fig. 5-6.

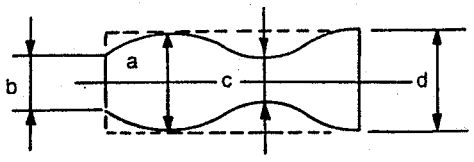


Fig. 2-6 Envelope Wareform Specification

D. If the section A in Fig. 5-7 does not meet the specification, adjust the S-Guide Roller up or down.
E. If the section B in Fig. 2-7 does not meet the specification, adjust the T-Guide Roller up or down.

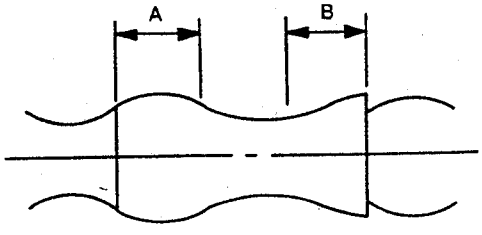


Fig. 2-7 Adjustment Point

F. After completing adjustment, turn the tracking Volume and make sure the envelope varies almost flat.
G. If the envelope varies as shown in Fig. 2-8, adjustment of the S-Guide Roller and the T-Guide Roller may be upset and then perform the adjustment again.

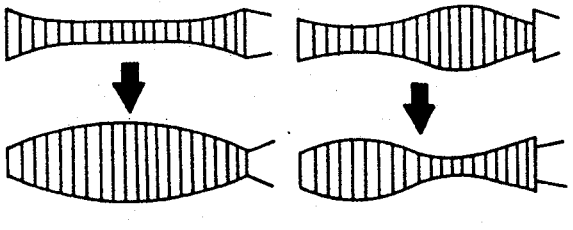


Fig. 2-8 Abnormal Waveform Variation

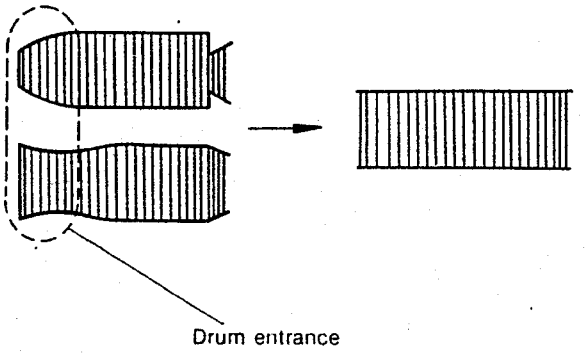


Fig. 2-9 Waveform Adjustment at the Drum Entrance

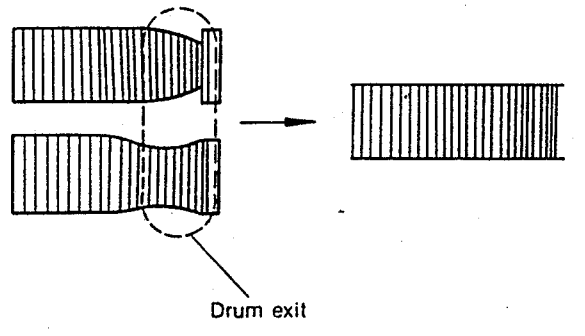


Fig 2-10 Waveform Adjustment at the Drum Exit

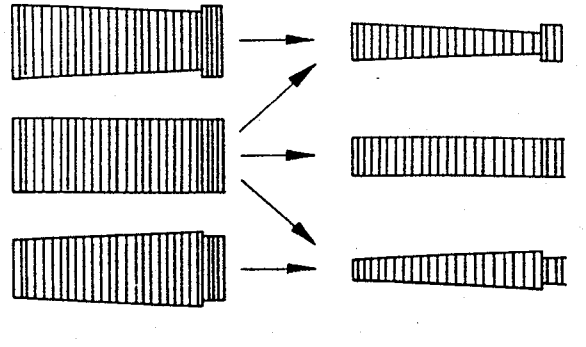


Fig. 2-11 Normal Waveform Variation

5) The fine adjustment of AC head

A. Tilt Adjustment (refer to Fig. 2-2)

Tape wrinkle check at the lower Flange of T-Guide Post Ass'y in Fig. 2-1.

a. If tape wrinkle is observed at the lower Flange of ⑪ adjust the Tilt Adjust Screw CCW until the wrinkle disappears.

b. If a gap observed between the lower Flange of ⑪ and the lower edge of tape, adjust the Tilt Adjusting Screw CW until the tape travels along the lower Flange.

B. Azimuth Adjustment (refer to section 2-3-2)

C. The X Position Adjustment for Interchangeability

a. Play back the Alignment Tape (SP mode) with stairstep (or monoscope) signal.

b. Place the Tracking Volume at its center click.

c. Trigger an oscilloscope with switching pulse and observe the envelope waveform of CH-2.

d. Turn the Adjust Cap CCW or CW within taper section and fix the Adjust Cap at the position where the envelope reaches a peak level.

e. Play back the Alignment Tape (EP or LP mode) with stairstep (or monoscope) signal.

f. Make sure the envelope is maximum at the center click position of Tracking Volume. If maximum envelope is not observed, perform the envelope adjustment to obtain maximum envelope output again.

g. Play back the Alignment Tape with stairstep (or monoscope) signal and make sure audio output is maximum.

• NTSC: 7 KHz • PAL: 6 Khz

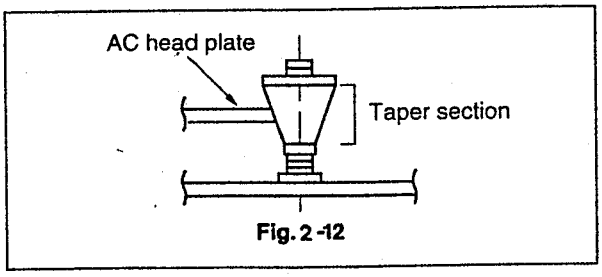


Fig. 2-12

6) Check for transitional operation from Review to Playback

A. Playback the Alignment Tape (SP mode) in the REVIEW mode and observe the envelope with an oscilloscope.

B. Switch the REVIEW mode to the PLAY mode. Make sure state within 3 seconds as shown in Fig. 2-13. If it does not rise within 3 seconds after servo locking adjust as follows.

a. Play back the Alignment Tape which has the stairstep (or monoscope) signal, looking Envelope Waveform, make sure that S & T-Guide Roller's height is adjusted correctly.

b. Change operation mode from Review mode to Play mode again and then make sure that the entrance envelope rises within 3 seconds after servo locking.

c. If not, perform the adjustment according to the section 2-3-4.

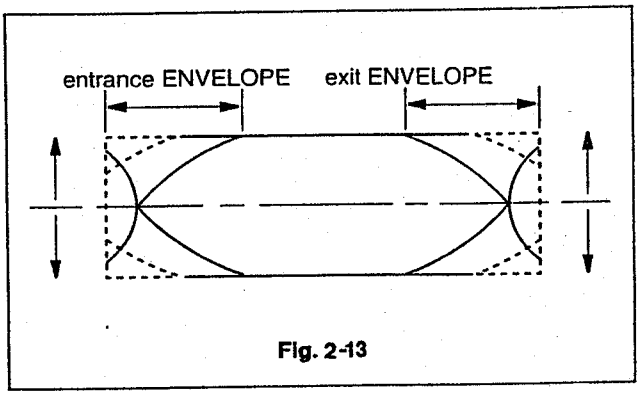


Fig. 2-13

7) Envelope Check

A. Record video signals (color bar or monoscope on T-120 Tape) and make sure the playback envelope output meets the specification as shown in Fig. 2-13.

B. In playing the same Video Deck used for the recording using the T-120, the envelope should meet the specification as shown in Fig. 2-14.

C. If the performance does not meet both specification, replace the Drum Total Ass'y.

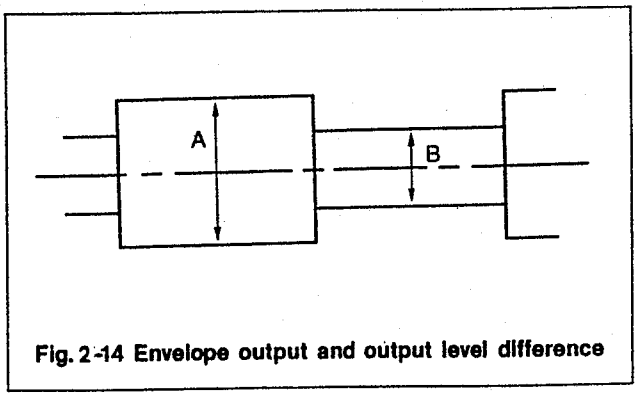
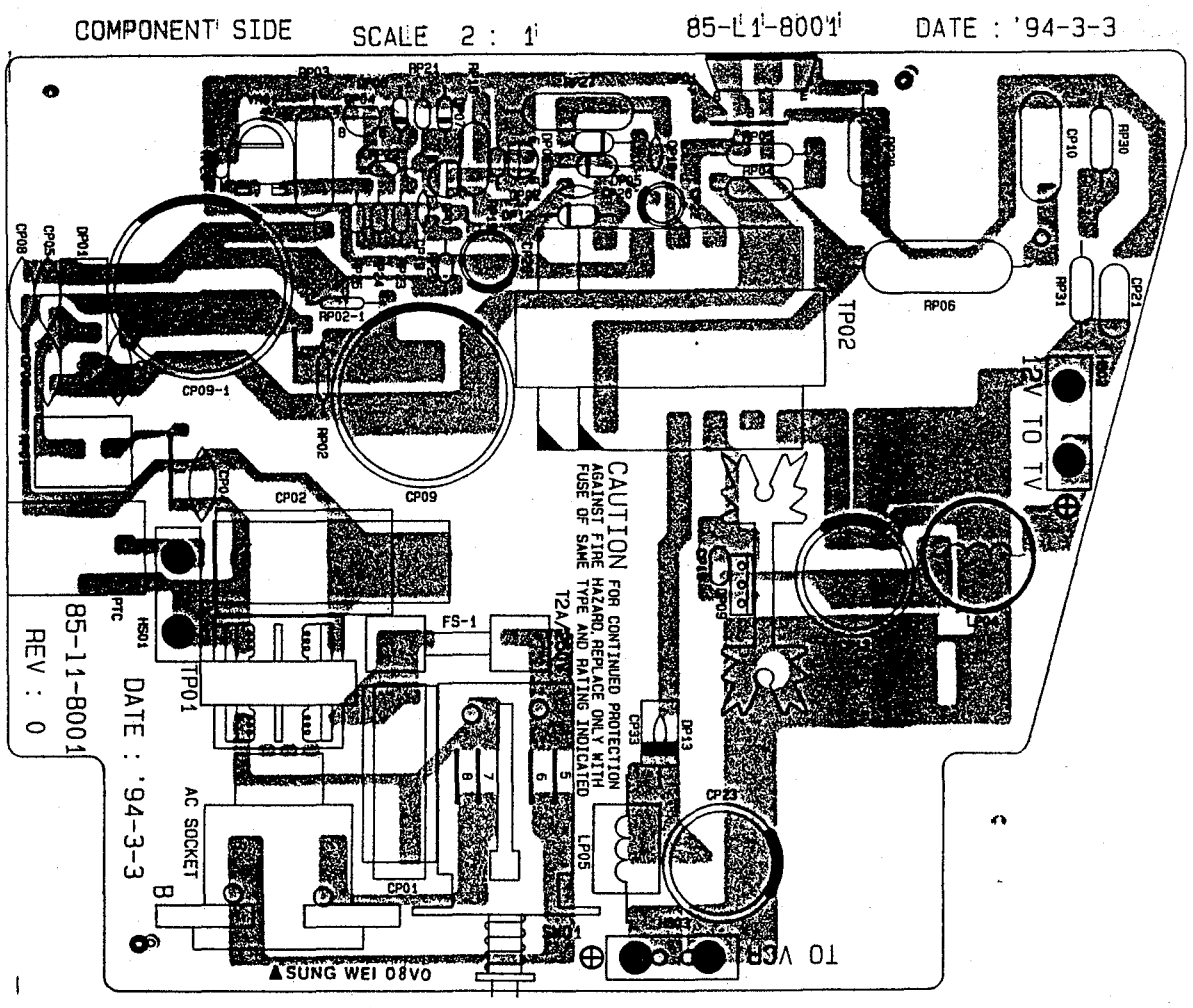


Fig. 2-14 Envelope output and output level difference

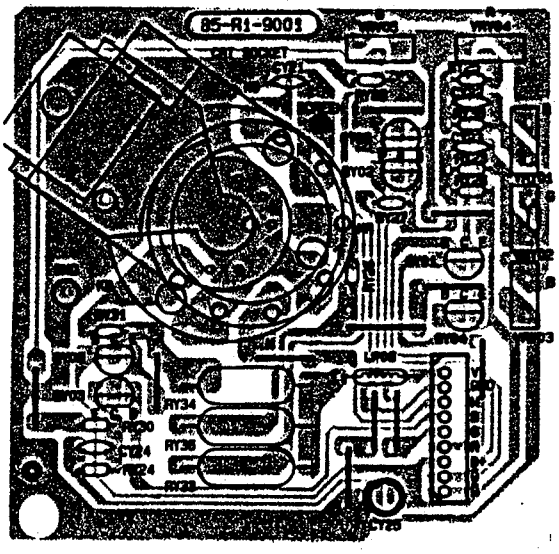
8) Final Check

Make sure no Tape wrinkle is caused at each guide.

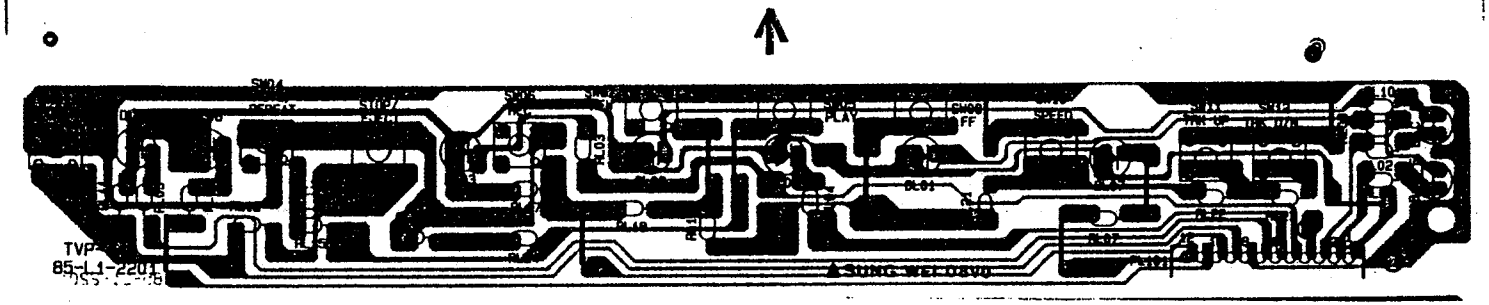
SW POWER P.C.B TOP VIEW



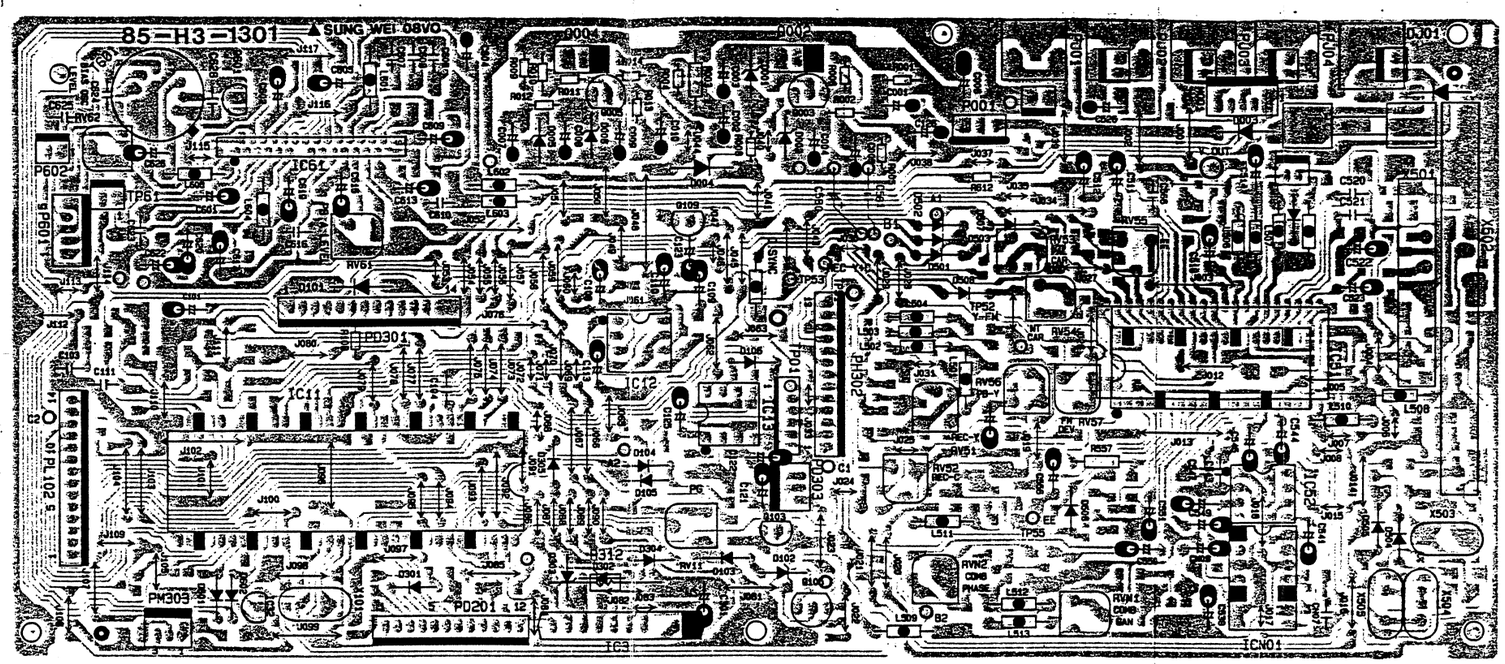
CRT SOCKET P.C.B TOP VIEW



KEY BOARD P.C.B TOP VIEW

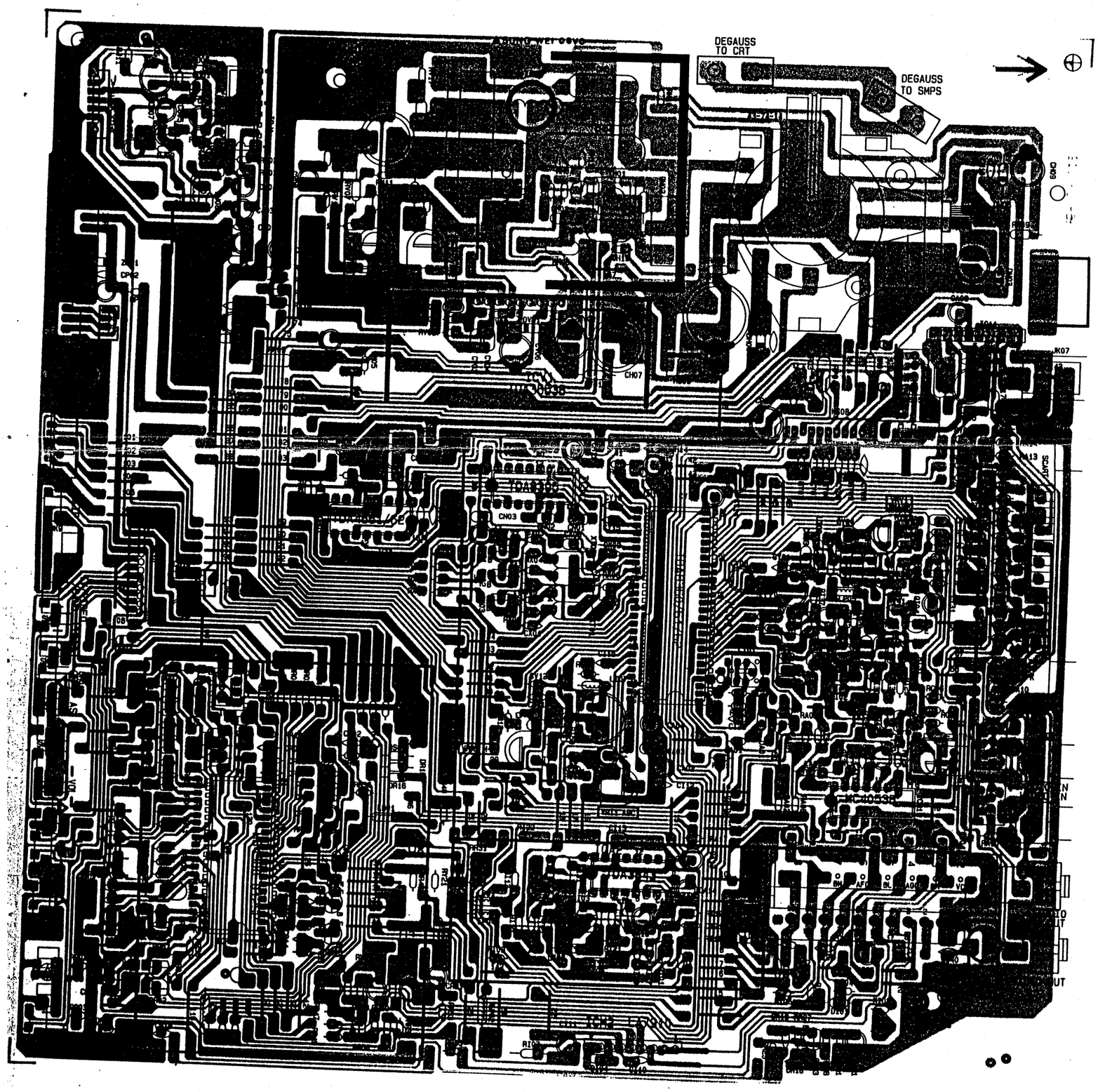


VDR MAIN P.C.B TOP VIEW

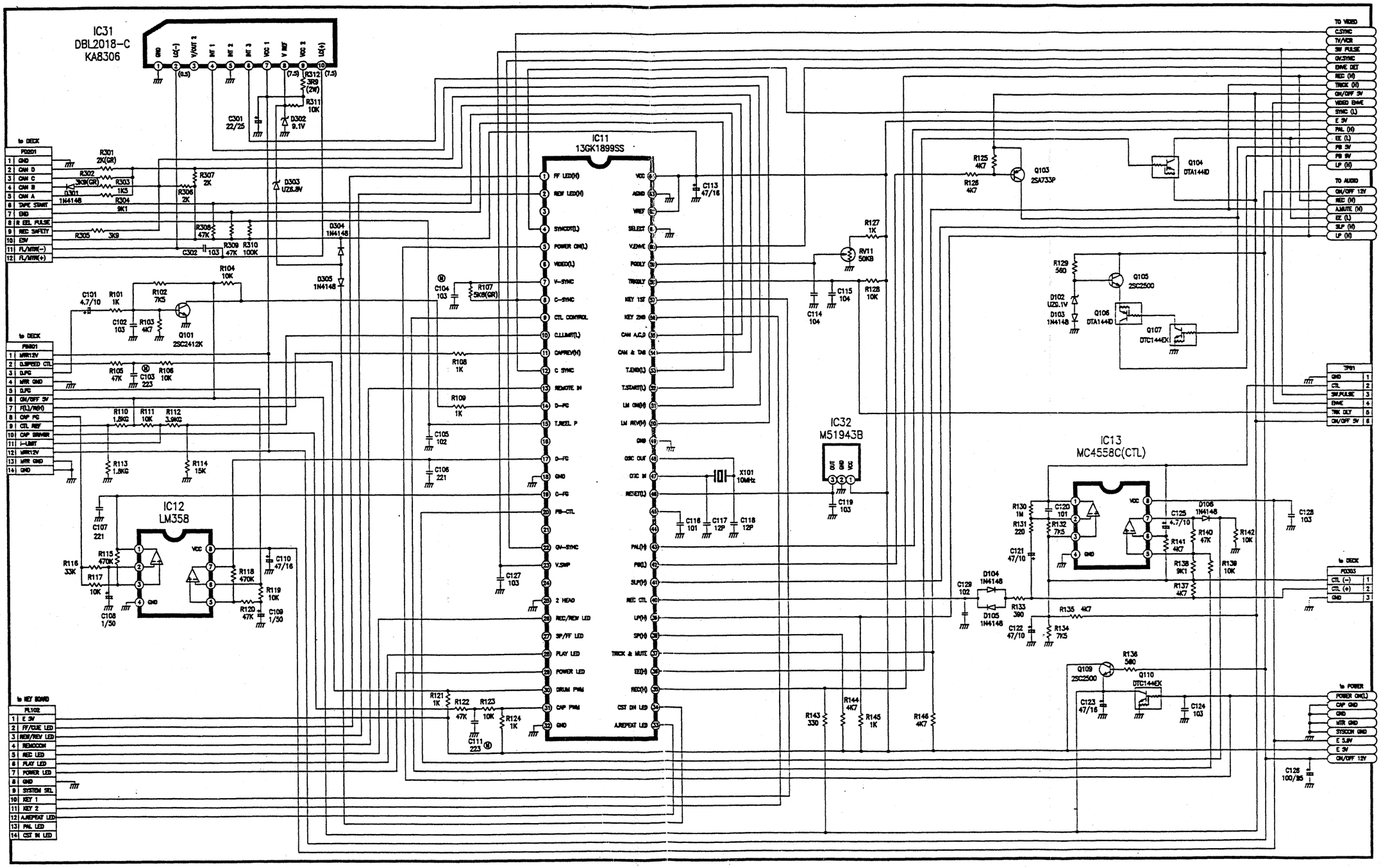


LENC-00157 / Druck 2

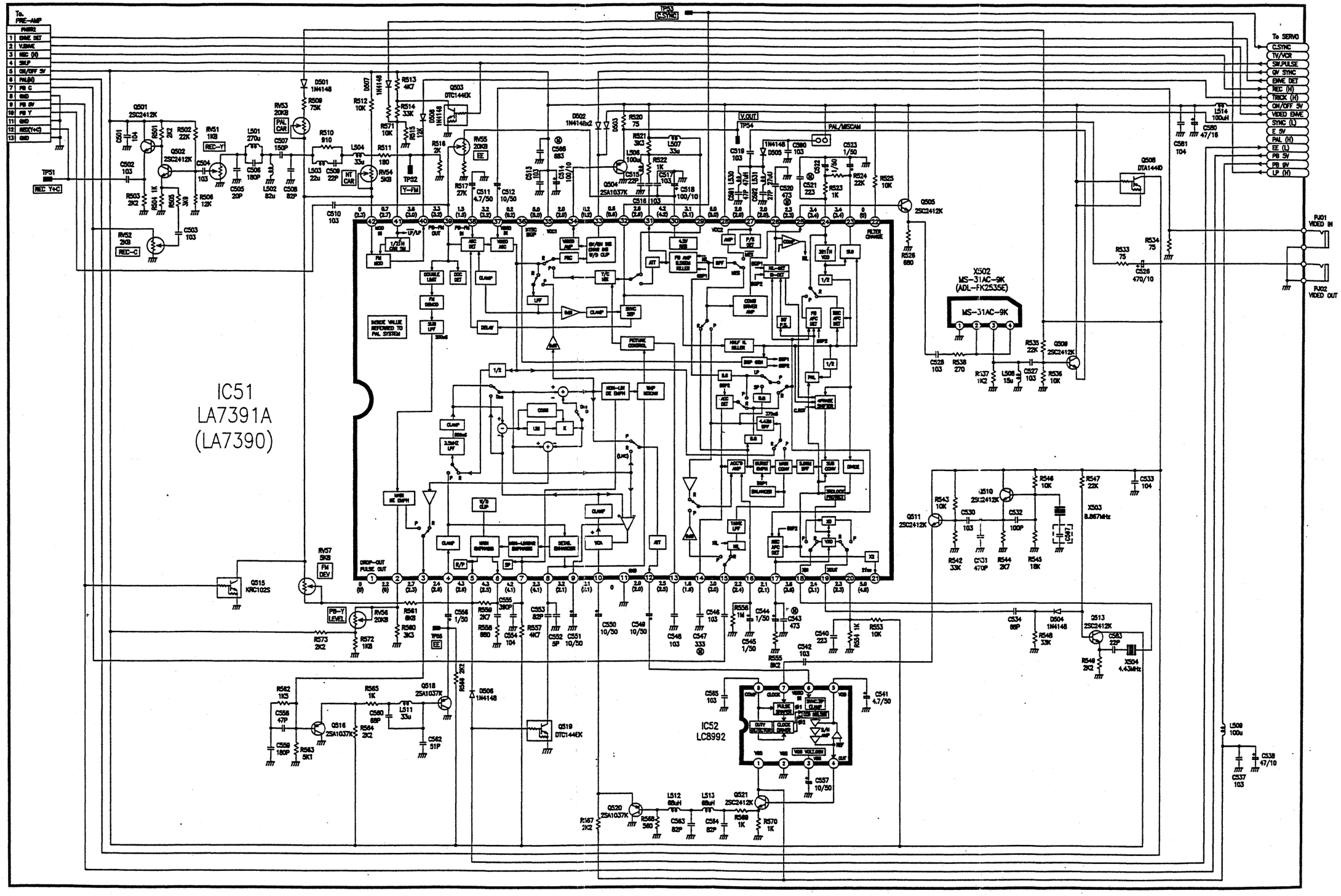
MAIN P.C.B. (Top View)



VDR SERVO/SYSCON SCHEMATIC DIAGRAM



VDR VIDEO SCHEMATIC DIAGRAM



TV SCHEMATIC DIAGRAM